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Student Attitudes in the Context of the Curriculum in Libyan Education in Middle and High Schools

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Abstract

In any country, the education of the next generation is of huge importance. For Libya, which has developed very rapidly, the education of young people will be vital for the future of the country. The main problem at present in Libya is the quality of education: the need to build so much in order to educate so many in a short time creates the classical dilemma of quality of education versus quantity of education, a problem common in many developing countries. There is also a shortage of Libyan school teachers at secondary school level especially those qualified in science subjects, as well as resource problems. The examination system emphasises the rote recall of information and holds great power over the learners at key times of the year. Against this background, students sometimes show their dissatisfaction by leaving school or simply failing to attend.

The aim of the present research is to look at Libyan education at various stages and ages from the student perspective: in middle (ages 12-15) and high schools (ages 16-20). The aim was to gain a picture of what was happening and to find out student's views about their learning experiences. Overall, the aim of this study is to offer insights into the perception, beliefs and attitudes of students in Libya in an educational system where growth has been phenomenal over the past five decades or so.

The study involved three major surveys using questionnaires. These involved very large samples (1939 in all), drawn from a wide range of schools and catchment areas, reflecting Libyan society. It was possible to analyse the responses by various subgroups. Great care was taken to ensure that the students responded to reflect what they actually thought by emphasising that the questionnaires were not seen by teachers, all questionnaires being anonymous. To confirm the picture given by the responses to the questionnaires, samples of students were interviewed using a checklist of key areas of interest. A sample of teachers was also interviewed to see to what extent their views matched those of the students.

A first survey offered an overview of students' views, the emphasis being on looking for trends with age. Age 12 is the first year of middle school under the Libyan system while age 15 is the uppermost year in middle schools. The other three groups are drawn from various stages in the high school. The second survey allowed students nearing the end of their studies at secondary school to reflect on their experiences and to offer ideas for the future. Students are able to reflect on their educational journey as they approach the end of schooling; and university, college or jobs are in the imminent future. In Libyan education, students make fixed subject choices (arts, sciences, technology) which determine their high school and curriculum. Once a choice is made, they have to continue with this for the remainder of their school time. The third survey focussed on the age group when these decisions have just been taken: first year in high school.

Finally, the interviews offered a useful way to see to what extent what the students said matched the pictures which had come from analysing the questionnaires. Interviewing a

sample of teachers gave added insights in offering a new perspective on the Libyan educational provision as seen from the teacher perspective. The main question was the extent to which teacher views matched student views.

The examinations system clearly poses many problems, including relationships to the curriculum as well as cheating. The students want less reliance on recall, less reliance on end of year examinations and they feel that they are being undermined by the ease of cheating. The system is dominated by the reward of accurate recall. There seems to be an expressed wish for freedom: freedom to question, freedom to express themselves, freedom to be released from the dominance of memorisation and recall. Despite this, they still rely on the security of the factual knowledge as the sources are often seen in black and white terms. Teachers are seen as authority figures and the curriculum is based tightly on prescribed textbooks. Students wish for curricula which are related to life and lifestyles as well as related to their needs, future needs and aspirations. Students were also seeking some kind of pastoral care and support for learning.

In looking at specific subject areas, the sciences need some overhaul. The students see them largely as memory driven and this presents the sciences as bodies of knowledge to be memorised rather than methods of enquiry or ways of interpreting and understanding the world around. They have a utilitarian view of language, wanting to start English at a very much earlier age so that it is available for the world of the sciences. Mathematics is a major problem area, generating very polarised views. The main problem subjects, therefore, appear to be mathematics and physics (with its abstractness) and, perhaps, chemistry. This is a matter of concern given the high proportions which take these subjects for career reasons.

The purpose of education is seen as based on careers, examination passing and recall. Understanding, applying ideas, creativity, questioning are all devalued. The idea of school education as a way to unlock potential seems missing and the students appear to appreciate that. The teacher's role is largely that of transmitting information in an efficient and effective manner to their students. The teachers have little insight in the role of their subjects in the development of young people. They are ruled by the demands of society, with its dependence on examination success for gaining access to the next stage of life. They find the curriculum overcrowded and want more time for students to be able to think. However, they have little clear idea of the nature and role of understanding and the idea of seeing their subject in terms of wider life (outside entry to careers) is largely absent.

Overall, the students are quite positive about many aspects of their experiences although they know of no other educational system. The most fundamental need is to generate a new way of thinking: where the recall of information under an examination-driven system is changed to an educational experience where understanding, applying ideas, creativity and questioning hold a much higher status. This will need a major paradigm shift for teachers and wider society in Libya.

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Chapter One

Attitudes and Education in Libya

1.1 Libyan Education: a System under Stress

The Libyan education system is very modern in that there were almost no schools at all some 50 years ago while today, education is free for all at all levels and the participation rate is extremely high. Any system growing at that rate is bound to face pressures and stresses. Over the period of time and, particularly in the past ten years, the system has been subjected to considerable development and change. This makes life very difficult for teachers. Equally, it is very difficult for parents to guide their young people when the system has changed so much since they were at school.

Such a rate of development has only been possible given the vast oil revenues generated in the country. Much has been invested in education but the education system has been seen in terms of the kinds of jobs which such an industry can produce. The need to build so much in order to educate so many in a short time creates the classical dilemma of quality of education versus quantity of education, with a shortage of Libyan school teachers at secondary school level, particularly those qualified in science subjects. Against this background, students are sometimes not very satisfied or fulfilled in their studies and sometimes show this by leaving school or simply failing to attend.

1.2 Aim of the Study

The aim of this study has been to offer insights into the perception, beliefs and attitudes of students in Libya in an educational system where growth has been phenomenal over the past five decades or so. Educational planning is rarely carried out by considering how the school students react to their experiences. Very often teachers are left implementing policies and programmes designed outside the schools. This study seeks to fill this kind of gap by exploring the attitudes of Libyan students from age 12-20 on aspects of their educational journey, especially in relation to the curriculum.

The aim in this study is to paint pictures. These will be student perceptions and attitudes to various aspects of their school experience (from age 12-20) to see how they are reacting to what has been offered to them. Of course, they will know no other experience.

1.3 Outline of the Study

Attitudes are very important in that they may well influence behaviour throughout life, long after the facts which have been taught are forgotten. The student voice is very important: after all, the school system is run for their benefit. Of course, in this, teacher attitudes will be critical.

Definitions and descriptions of attitudes are reviewed and a broad definition of 'attitude' is proposed while various types of attitude are discussed. It is also recognised that not only is knowledge important, but also that the understanding, application, appreciation and use of that knowledge is a key part in education. Students need to develop their own attitudes and to be able to see the implications arising from what they are learning. Some of the research which has explored the way attitudes grow and develop has, therefore, been an important part of this study in that this offers insights into the kinds of curriculum experiences where attitude development is likely to take place.

With lecture type instruction in Libyan schools, there will be few opportunities for attitude development in any kind of systematic way. Thus, students in Libya are likely to develop their attitudes in their own ways, largely unstructured, and sometimes on an inadequate cognitive base. The Libyan system, its history and development will be outlined, as a background to this.

The literature stresses that the development of attitudes has to serve a function within the individual. Overall, they allow the individual to make sense of the world: sense of their surroundings, sense of themselves, sense of relationships. Attitudes are directed towards an object and, in education, it is important to consider attitudes towards subjects studied, study itself and towards topics and themes being studied.

This study will look at some of the key features of the findings from attitude development literature which can be applied in an educational setting. Attitude measurement is never easy and this will be discussed, with some criticisms of some of the current approaches.

A series of surveys will be described. The first will seek to gain an overview, with the emphasis on how attitudes change and develop over an 8 year period (from age 12-20). When nearing the end of their school career, students are asked to look back at their experiences as well as look forward to see how what has been given to them is seen as preparing them for their futures.

One of the key features of Libyan education is the way the curriculum is divided up into specialist streams (arts, science and technologies) and the age of decision is critical for the

students in that, once committed to a stream, they are there for the remainder of their school career. Students at this age were surveyed to see what factors influenced their decisions most strongly and how various aspects of the educational provision affected them.

All of this work was conducted using surveys of very large samples of students. The final stage was to go into schools and talk to some of the students and see to what extent the findings from the surveys were matched by what they said. Some teachers were also interviewed to see how they saw the system.

1.4 The Aims of Education for Libya

It is clear that the Libyan government has developed an education system at a great rate. It seems that education is regarded as important for the development of the country. Indeed, education can be thought of as the means by which we ensure the future development, prosperity and cultural identity of the country. However, the real challenge is to maintain this achievement by reducing school dropout rates and encouraging students, particularly girls, to continue their education at the higher levels

An interesting issue is what the gains are which can arise from education. This can be considered from two standpoints: what the student can gain and what Libyan society can gain.

Of course, students can gain knowledge in terms of things they can recall. They can also gain understandings of the world around: the physical and biological world; the world of society in Libya; and the wider world. Indeed, they can develop understandings of themselves as they move through adolescence into adulthood. Hopefully, there will be opportunities for the students to see how their knowledge and understandings can be applied in practice. However, much of this is set in the cognitive and academic. For many students, they will not excel in such skills but may be better equipped to undertake courses which will develop skills leading to useful careers and jobs in Libyan society. The overall aim is to offer a educational experience which allows for the development of all the potential with each student.

The other standpoint is to see what students will be able to give to Libyan society. An obvious starting point is that there are specific jobs and careers where there is a huge need for well qualified young people to make a major contribution. However, most students from school will need to have attitudes which will encourage them to become life-long learners, whether at university, vocational training, the workplace or simply in ordinary

living. Education must not be seen to stop when the student graduates from school or university. Most school students will sooner or later become husbands, wives and parents. Education needs to prepare them for these demanding roles and the quality of family life in any society may well influence the quality of that society. Society needs citizens who will act responsibly, take on leadership roles, and be available to offer help and support to others as needed, within and beyond Libya. There are major issues for Libyan society today: for example, the need for population control, the need for energy provision when the oil and gas run out, the need to develop resources in a country where desertification continues.

This is in no way a comprehensive description of the aims of education but it seeks to offer a few insights on the needs in Libya at the moment. The real question is the extent to which Libya is being successful in achieving some of the aims for its educational development, given the present needs of the country. It is hoped that this study will offer some insights, from the student perspective, of how they see their educational experience.

To complete this overview, this study is presented as follows:

Chapter 2: reviews definitions of attitudes, how attitudes are formed and also how attitudes change.
Chapter 3: explores the ways attitudes can be measured leading to how these were used in this study.
Chapter 4: considers social psychology research on attitude development and applies this to educational contexts.
Chapter 5: outlines how the Libyan education system works and explains in some detail how data are gathered from different schools.
Chapter 6: (*first survey)* looks at the overall development of attitudes, with emphasis on the three major curriculum areas in Libyan schools.
Chapter 7: (*second survey*) looks at students nearing the end of their studies at secondary school, reflecting on their experience during their education journey.
Chapter 8: (*third survey)* focusses on the age group when decisions about curriculum choice are taken for the first stage in high school.
Chapter 9: describes the final stage in the surveys (i*nterviews*) and seeks to see how the interviews relate to the responses to questionnaires.
Chapter 10: looks at the outcomes from the whole study, bringing together the findings and attempting to draw conclusions. The strengths and weaknesses of the study are summarised together with the possibilities for future research work.

Chapter Two

Attitudes and Education

2.1 Introduction

Attitude research continues to occupy a central position in social psychology. Considerable work has been done investigating the variables influencing attitudes formation and change and the effects of attitudes on individual behaviour. In other words, the scope of attitude research is simply enormous, and the significance of the outcomes for theory and practice cannot be denied for almost all aspects of human life.

School and university education lays considerable emphasis on skills of recall, understanding and thinking. Attitudes are often largely ignored. Although some school curricula do specify some attitude aims. In science education in Scotland as far back as 1967, Curriculum Paper 7 specified attitudinal outcomes while, more recently, the Scottish 5-14 Guidelines in Science (2000) offered some aims: "so that pupils develop ..... informed values and attitudes towards the environment through relating their learning to the real world and themselves." However, the references are general and vague and offer teachers little guidance about how attitudes can be developed. In general, the emphasis in most school curricula is on the knowledge and skills to be developed and this is reflected in the assessments used. In a sense this is almost inevitable: part of the reason for this is the difficulty in defining what an attitude is and partly because attitude measurement is a complex area. However, while the assessment of attitudes remains problematic, it is difficult to bring them into any assessment system in a way which is fair to all.

Thinking of science, many years ago Ramsay and Howe (1969) noted that, "*A student's attitudes towards science may well be more important than his understanding of science, since his attitudes determine how he will use his knowledge.*" This perception may well be important in many subject areas in the curriculum. Much of what is learned at school is later largely forgotten. However, attitudes towards learning, specific subjects or specific teachers can remain very powerful influences in later life.

This chapter seeks to consider what attitudes are, why they are important and how they fit into educational thinking. Later chapters will consider their measurement and how attitude development and change can occur.

The twentieth century saw developments in methods for attitude measurement and attitude definition and this led on to much work which indicated the general principles by

which attitudes develop. Later work then moved on to the way attitudes are organised and stored. The study of attitudes held great promise for students of social psychology early in the twentieth century. However, the field is complex and, despite the enormous volume of research, there is still much left unresolved (Rajecki, 1990). This chapter seeks to offer a brief summary of the main developments and shows how this will underpin the empirical studies conducted here.

2.2 History of Attitude

The study of attitudes has a long and complex history in social psychology (Oppenheim, 1992, p.174). The idea of attitude was first studied in a laboratory setting by Lange back in 1888 in conjunction with studies of reaction time (see: Mostyn, 1978). She observed that the "Aufgabe" or task attitude played a decisive role in all psychological experiments of perception, recall, judgement, thought, etc. By the turn of the century (around 1900), there was a lively controversy over the place of attitudes in consciousness. Introspection was applied to the problem as it was being applied in all psychological fields including studies of emotions, memory, thinking, morality, language acquisition, aggression and abnormal behaviour in particular. However, the work was held up by the reluctance of psychologists to explore latent constructs, the dominant perspective being that of behaviourism. Thurstone's pioneering work (Thurstone, 1928) opened a new opportunity for research development.

This led to the work of Likert (1932) and there then followed a very considerable growth in attitude research (see, for example, Hovland *et al*, 1957). From this, several major outcomes can be observed. Firstly, there was the introduction of endless definitions of attitudes and general agreement was slow in coming (see, for example, Johnstone and Reid, 1981). Secondly, many of the practical conditions for attitude development and attitude change started to become apparent (for example, the pioneering work at Yale University [see Hovland *et al*, 1957; the work of Festinger, 1954]). Much later, many questions were raised about attitude measurement (see Reid, 2006).

The following summarises the broad trends. Social psychology started to take the study of attitudes seriously in the 1920s.

1920-1940	Development of attitude measurement techniques.
1950-1960	Growth of attitude theories.
1970-1990	Studies in attitude structures.

2.3 Definitions

One of the earliest definitions, but one which is still influential and widely quoted, is that of Allport and dates from 1935.

> *"An attitude is a mental or neural state of readiness, organised through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related".*

The definition of attitude also has a "long and complex history" (Oppenheim, 1966). In 1929, Thurstone, one of the first who investigated the problems of attitude measurement described an attitude as "*the affect for or against the psychological object"* This early attempt placed the emphasis on the affective, ignoring other aspects, and it illustrates how defining attitudes is not easy.

Firstly, Allport (1967) notes the difficulty in constructing a definition sufficiently broad to cover the many kinds of attitudinal determination which psychologists today recognise while, and at the same time, narrow enough to exclude those types of determination which are not ordinarily referred to as attitudes. There are many definitions but the chief weakness of most of them seems to be their failure to distinguish between attitudes, which are often very general, and habits, which are always limited in their scope (Allport, 1967).

Fundamentally, there is a lack of clarity with language. Words like attitude, habit, opinion, perspective, belief, all seem to be used and it is not always clear exactly how one researcher is using a particular word. The problem of language will be addressed further later.

Secondly, a precise definition of attitude is difficult because the concept overlaps with other kinds of psychological concepts and it is in this area of overlap that some clarification must first be attempted. Thirdly, different researchers have tended to use different definitions. Each definition has a different meaning according to the context in which attitudes are considered and the point of view of the person defining the attitude. Therefore, it seems impossible to present a precise definition in one sentence. However, it is possible to pick out several core factors, which must be considered in constructing an attitude definition.

Following Allport's (1935) definition, there have been numerous developments over the years [e.g. Krech and Crutchfield (1948); Doob (1947); Katz and Sarnof (1954) and Osgood *et al* (1957)]. Later, in 1958, Rhine developed a very simple picture when he referred to an attitude as a "*concept with an evaluative dimension*". The word 'evaluative' seems important.

Some later definitions tended to concentrate on the idea that attitudes are aspects of learning. For example, Krech (1946) suggested that attitudes represented attempts by a person to make sense of the social world. In this way, attitudes could be thought of as "problem solving attempts" and, therefore, an intrinsic part of learning. Doob (1947) similarly brought a behaviourist point of view to his study of attitudes and saw them as just another aspect of learning and thus part of learning theory.

The key developments established that attitudes involve more than the cognitive and, in particular, the "evaluative dimension" proposed by Rhine (1958) offers a key insight. Perhaps, this is what distinguishes an attitude from other latent constructs. An attitude involves knowledge: the person holding an attitude needs to know something about the person or 'thing' about which an attitude is held. An attitude may involve feelings: the person may like, hate, resent, enjoy. An attitude may involve experience: the person may have done something, seen something or had something done to him/her. However, the key things is that the person has evaluated some person, event or 'thing'. Such an evaluation may affect subsequent behaviour.

An example from a school pupil illustrates the situation. Suppose an individual pupil, moving from primary to secondary schooling, has heard that she will be studying physics. She may not know much about physics, may never have experienced learning physics and has no emotional reaction towards studying physics other than curiosity. After one year in a physics class, she now knows something about physics, she has gained experience of studying physics, has developed all kinds of emotional reactions to physics, physics laboratories, a physics teacher and to the kinds of themes being studied. She may now develop an attitude towards physics, evaluating all that she has experienced, learned or felt. This, in turn, may influence her strongly to take further physics courses or to choose something else.

Attitudes tend to show stability (Roediger *et al.*, 1984) and the imaginary pupil described above might have developed a negative attitude towards physics and that attitude might remain for years, influencing other activities and decisions. Thus, attitudes tend to have features of some stability and tend to lead to certain relatively consistent patterns of behaviour. Nonetheless, Cook and Selltiz (1964) observed many years ago that attitudes, on their own, do not control behaviour. Eventually, this led to the development of the theories of planned action and planned behaviour (Ajzen and Fishbein, 1980; Ajzen, 1989). These will be discussed later.

The descriptions above lay emphasis on the fact that attitudes have three 'components', in varying proportions.

(1) A knowledge about the object, the beliefs, ideas components (Cognitive).
(2) A feeling about the object, like or dislike component (Affective).
(3) A tendency-towards-action the object component (Behavioural).

(see: Bagozzi and Burnkrant, 1979 and McGuire, 1985)

However, although attitudes tend to be stable with time, they are open to some change and development. Nonetheless, deeply held attitudes are highly internalised and are resistant to modification (Reid, 2006).

Eagly and Chaiken (1993, pp. 1-2) bring together many ideas when they state,

> *"Attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour. Psychological tendency refers to a state which is internal to the person, and evaluating refers to all classes of evaluative responding, whether overt or covert, cognitive, affective or behavioural. This psychological tendency can be regarded as a type of bias that predisposes the individual towards evaluative responses that are positive or negative. An attitude develops on the basis of evaluative responding: an individual doesn't have an attitude until he or she responds evaluatively to an entity on an affective, cognitive or behavioural basis. Evaluative responding whether it is covert or overt can produce a psychological tendency to responds with a particular degree of evaluation when subsequently encountering whether the attitudes object if this tendency to response is established, the person has formed an attitude towards the object."*

The central idea in the helpful Eagly and Chaiken analysis is that on 'evaluation' but their view reflects the kind of approach adopted by most researchers today. Thus, the following descriptions may also be helpful in summarising what is known today.

Attitudes,-

(a) Involve cognitive, affective and behavioural elements with an essential evaluative dimension.
(b) Are learned and they can develop with new input of a cognitive, affective or behavioural nature, or any combination.
(c) Can affect subsequent behaviour.
(d) Cannot be observed directly but must be inferred from observed behaviour.

Figure 2.1 brings the key ideas together and offers a working definition or model which will be used in this study. It includes the key ideas from Allport's early definition but stresses the evaluative nature of attitude while bringing in the knowledge, emotion and behavioural elements. It also illustrates how attitudes can influence behaviour.

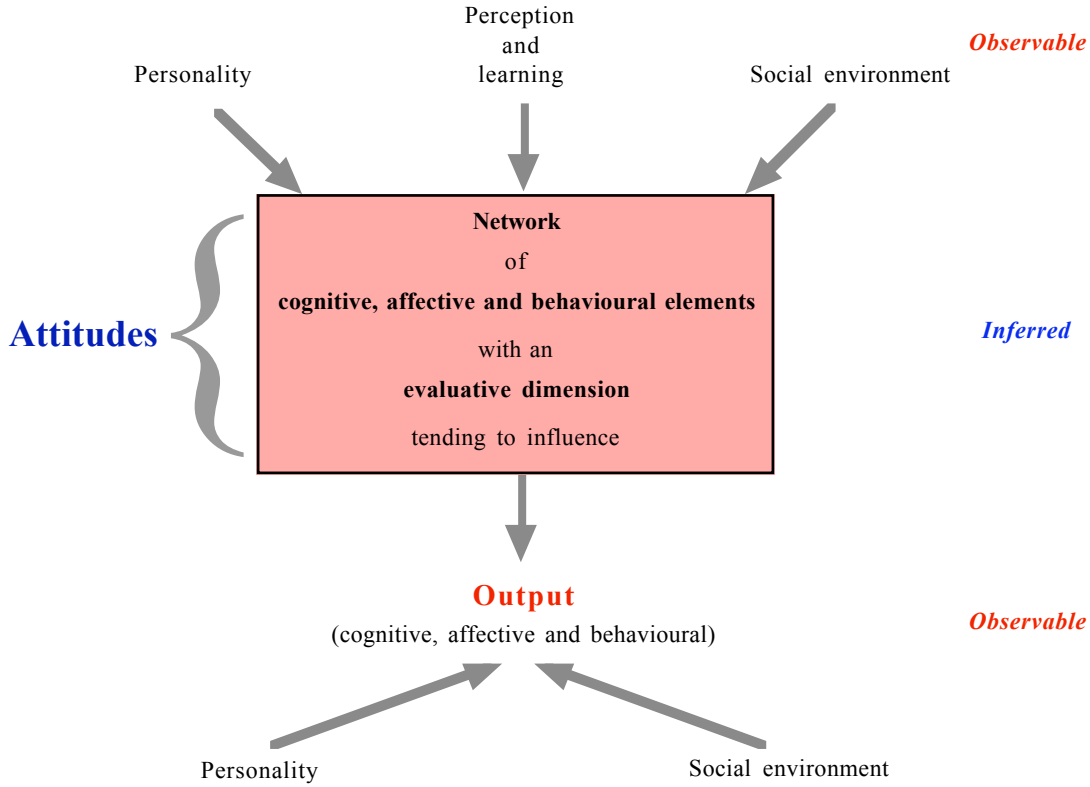


Figure 2.1 A Model for an Attitude (developed from Reid, 1978).

There is much discussion about the nature of attitudes but an important point was made by Reid (2003) when he noted that any attitude must have an attitude target. A person has an attitude towards something or someone. In an educational setting, it can be a very broad target: for example, learning, teachers, school, study. It can also be very precise: for example, laboratory work in biology, the Arabic teacher, the mathematics textbook.

Considerable research has been conducted on attitudes towards a subject like physics (see, for example, Reid and Skryabina, 2002), attitudes towards mathematics (see, for example, Al-Enezi, 2007) and social attitudes arising from studying chemistry (see Reid, 1980). Another area of great interest is the theme of attitudes towards learning and study although these overlap with epistemological understandings. The work of Perry (1999) with university students stands out here.

Attitudes are stored in long term memory in complex networks related to experiences, memories and knowledge. In essence, therefore, they can be regarded as learned although the mechanism of learning may not be exactly the same as that for knowledge (see Johnstone and Reid, 1981).

Mostyn (1978, p. 12) notes that,

> *"Learning theorists postulate that attitudes are learned through conditioning; that is when certain attitudinal expressions are rewarded, such as stating a preference for a particular political candidate among one's peer group, an attitude will be developed".*

There is often a confusion about attitudes with some seeing them as 'ethereal abstractions' while others are really looking at behaviour and seeing attitudes in terms of behaviour. Mostyn notes this when she states (1978, p. 13):

> *"Some researchers see that attitudes are "essentially ethereal abstractions". The belief that attitudes are a potpourri of feelings, emotions, sensations, precepts, cognition, associations, vague rumours and even reinforced ideas which are only aroused when the individual is confronted with a request to tell someone else his/her attitude towards something or some person is becoming increasingly common among some researchers. Whereas other researchers see that "attitudes can't really be measured but only inferred from behaviour."*

However, more recent understandings have demonstrated that attitudes and behaviour are not the same although each may influence the other extensively (see Ajzen and Fishbein, 1980; Ajzen, 1989).

In this study, the picture shown in figure 2.1 will be employed to offer a definition. The key points are that attitudes may involve the cognitive, affective and/or behavioural; measurement is implicit; attitudes may influence subsequent behaviour.

2.4 The Language of Attitudes

The language of attitude is so important to attitudinal experience and expression. Eiser and Ross (1977, pp. 477-489) noted that most techniques for measuring attitude rely heavily on verbal material in the form of interviews or questionnaire. The possibility of confusions of meaning is, therefore, considerable. However, it has to be noted that the measurement of subject knowledge and understanding through typical examination papers also relies on the written word. While language confusions can and do arise, for much of the time examinee know what is being asked of them and can seek to respond appropriately, if not always successfully.

Nonetheless, there are potential problems with language. The relationship between thought and language may operate both ways. Language is likely to be the medium through which new information is brought to mind, and through which new possibilities are asserted and new arguments are proposed. Words and ideas can be confused and thus

evaluation may be flawed (See Eiser, and van der Pligt, 1988, especially pp. 1-43).

Although we may use language to express our attitudes, it does not follow that every one will interpret what we say in the same way. On the contrary, how we judge other people's attitudes from the statements they make can be influenced by a number of factors, including especially our own attitudes on the issue in question. This was first demonstrated in a study by Hovland and Sherif (1952).

On the other hand there are numerous words, which have been used in the attitude literature. For example, the word beliefs, opinions and attitudes are all used. Often, the words have been used synonymously leading McGuire (1969, p. 152) to characterise the situation as "*names in search of distinctions rather than distinction in search of a terminology*." When distinction between attitude and opinion has been drawn, they have been of several general types. One approach has been to see opinions and beliefs as generally narrower in scope than the broad evaluative orientation, which we call an attitude. Another way is to emphasis the emotional content of opinions and beliefs (see Oskamp, 1977).

One recent analysis (Oraif, 2007, p. 40) tries to clarify the language by suggesting a kind of hierarchy (see figure 2.2).

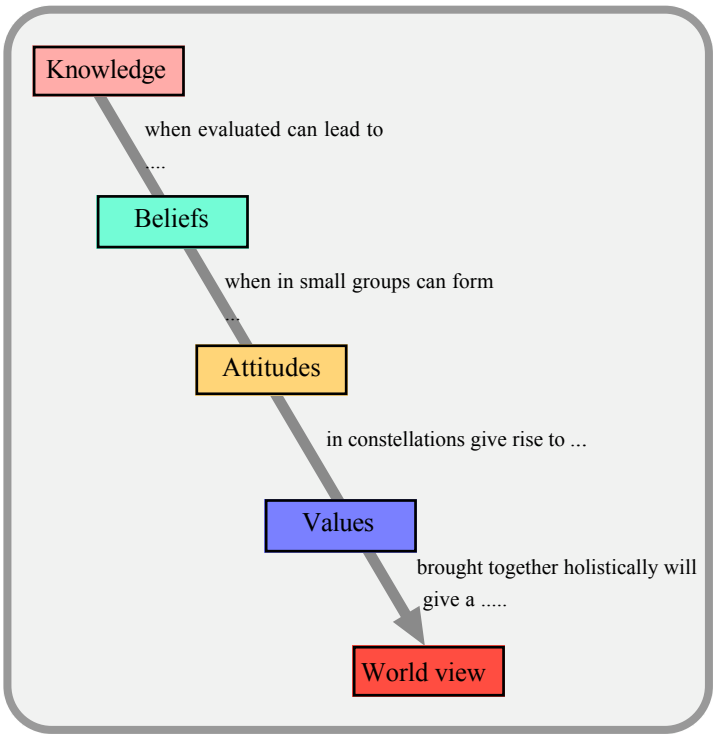


Figure 2.2 Terminology relating to 'Attitude' (Source: Oraif, 2007)

In this study, the word 'attitudes' will be used. This will encompass beliefs which, in turn, involve knowledge. They key thing is that a belief involves some kind of evaluation and an attitude is made up of a group of evaluations. For example, a student may develop beliefs about sciences: they are difficult, interesting, relevant, badly taught, have poor textbooks but good laboratories. This will make an attitude towards sciences. The important thing to note is that an attitude towards the sciences is highly complex and multi-faceted. It is, therefore, not easily open to simple measurement in terms of a number or score. This point will be considered again in the next chapter when looking at measurement.

2.5 Attitude Importance

The importance of attitudes in understanding psychological phenomena was given formal recognition early in the history of social psychology. For example, Allport (1935) considered the attitude concept as "*the most distinctive and indispensable concept in contemporary American social psychology.*" Other writers liked the concept even more , to the point of defining social psychology as the study of attitudes (Eagly and Chaiken 1993).

One key aspect is the recognition that attitudes can affect behaviour (see Ajzen and Fishbein, 1980). Thus, there is the possibility (indeed, perhaps probability) that the personal importance of a person's attitude toward an object may play an important role in knowledge acquisition. Personal importance and the amount of information a person has about an object have both been recognised for some time as attributes related to the strength of the person's attitude toward the object. The *"more importance a person attaches and the more knowledge she or he has, the more likely the attitude is to be resistant to change, persistent over time, and influential in directing thinking and actio*n" (Petty and Kronsnick , 1995).

There are also other things about the importance of attitudes. It is important to recognise that students will develop their own attitudes. Curricula, examinations and teachers themselves may place little or no emphasis on attitudes but, nonetheless, attitudes related to learning experiences will develop. Ignoring attitudes in thinking about teaching and learning will not stop the students developing attitudes. Thus, in the specific area of three subject disciplines in Higher Education, Reid (2003, p. 33) notes that,

> *"If the teachers think that the task is to communicate astronomy, chemistry and physics ideas and nothing more, that will not prevent the learners developing attitudes related specifically to these subjects and their pedagogy. Attitudes cannot be neatly separated from study; indeed, they may affect study very significantly."*

The second thing is that, because attitudes influence subsequent behaviour, they are extremely important in every aspect of living. Mostyn (1978, p.5) notes that:

> *"Attitude theory affects almost every facet of personal life and every field of endeavour. Doctors are as concerned with how attitudes form and change as are teachers, business managers, law enforcement agents, social workers, journalists and advertising agents. Many areas of attitude research are wholly or partly concerned with broad social issues such as racial prejudice, preventive medicine, environmental problems or political behaviour while there is no doubt that these issues are for the average person more ego-involving than brand and product preferences."*

Within education, attitudes are also very important. Negative attitudes towards specific subjects areas can prevent further study or make it unproductive. Attitudes towards the processes of learning can also have very large effects, potentially cutting a student off from further study. Attitudes will also develop towards topics studied and these can be carried out into future living with good or bad effects on subsequent decisions.

Reid (2003, p. 33) has noted that, in the context of science education, there were four broad areas where attitudes were important:

"(a) Attitudes towards subjects being studied;
(b) Attitudes towards study itself:
(c) Attitudes towards the implications arising from themes being studied;
(d) The so-called scientific attitude."

Although he questions the final area (suggesting it might not really be attitudinal), the other three clearly have significance for all learners in all areas of study.

According to Triandis (1971), "*An attitude is an idea charged with emotion which predisposes a class of actions to a particular class of social situations"*. This focusses on actions. That is why attitudes have an important meaning both for us and also for other people: attitudes held help other people to know what to expect from us. Knowing attitudes "*presumably helps others to predict the kind of behaviours we are likely to engage in more accurately than almost anything else we can tell them"* (Petty and Cacioppo, 1981, P.8). The whole area of attitudes and behaviour will be discussed more fully later in this chapter.

2.6 Attitude Analyses

Attitudes are latent constructs. According to Eagly and Chaiken (1993), since attitudes are latent constructs, they cannot be measured directly and the only way to know about attitudes of people is to observe their responses that reveal people's attitudes. These can be divided in three categories as well: cognitive responses, affective responses and behavioural responses.

It is unlikely that there is a direct relationship between the way an attitude has been formed and the way it has been expressed to responses and formed on the basis of cognitive, affective, and behavioural processes. This tripartite view of attitudinal responding and attitude formation raises a number of important questions. The question is whether attitude *must* have all three of these aspects, either at the point of attitude formation or at the point of attitudinal responding (Eagly and Chaiken, 1993. p.16). Some attitudes may be formed mainly by cognitive processes, others mainly by affective input while, for others, the experiences of life may be dominant. Similarly, some attitudes may be expressed mainly in cognitive terms while others are expressed mainly affectively or in terms of behaviour.

Thus, the responses that express evaluation and, therefore, reveal people's attitudes can be divided into three classes: the cognitive, affective and behaviour (Katz and Stotland, 1959; Rosenberg and Hovland, 1960). In addition, people's attitude can be formed thorough cognitive, affective, or behavioural processes exclusively or through different combinations of them (Zanna and Rempel, 1988). Figure 2.3 illustrates this.

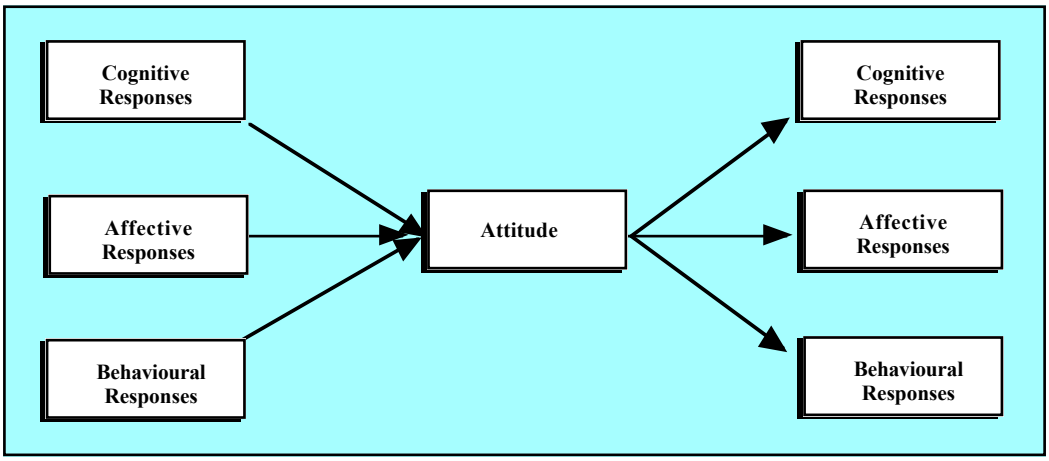


Figure 2.3 The ways of attitude formation and expression (derived from Eagly and Chaiken, 1993)

An attitude is held internally and is an inferred state, with evaluative responses divided into three classes (Cognitive, affective and behavioural). Figure 2.4 illustrates this.

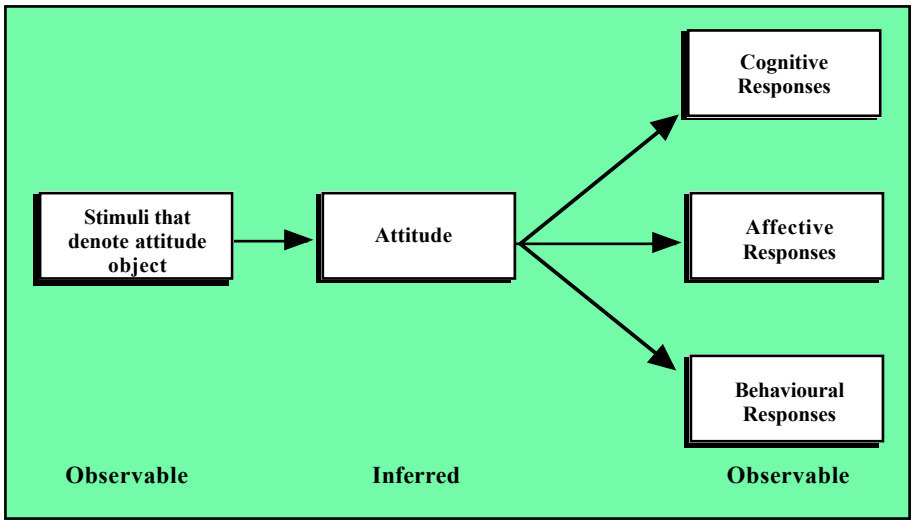


Figure 2.4 Attitudes are Inferred (derived from Eagly and Chaiken, 1993)

The *Cognitive* category contains thoughts that people have about the attitude object. The *affective* category contains feelings or emotions the people have in relation to the attitude object. The *behavioural* category encompasses people's actions with respect to the attitude object (Rosenberg and Hovland, 1960; Fishbein and Ajzen, 1975). Cognitive evaluative responses include the covert responses that occur when these associations are inferred or perceived as well as the overt responses of verbally stating one's beliefs. On the other hand, Eagly and Chaiken (1993, p.11) have argued that affective responses can also range from extremely positive to extremely negative and therefore can be located on an evaluative dimension of meaning. In general, people who evaluate an attitude object favourable are likely to experience positive affective reactions in conjunction with it and are unlikely to experience negative affective reactions; people who evaluate an attitude object unfavourable are likely to experience negative affective reactions and are unlikely to experience positive affective reactions.

In the context of education, attitude development will focus heavily on the cognitive. Thus, students form beliefs about an attitude object. Beliefs connect an attitude object with its different attributes that can be evaluated. For example, if mathematics and physics as subjects are considered as an attitude object, the students attitudes to these subjects may involve many beliefs and these will have a strong cognitive aspect.

By observing a student doing mathematics in the class, it may be possible to evaluate what kind of of attitude towards the subject this student holds. Very often people's overt action can be the best demonstration of their attitudes.

2.7 Attitude Theories

Attitude theories are the attempts by researchers to bring together many observations leading to a coherent underpinning or rationalisation. The problem is that there are so many contexts for attitude research and this has lead to a wide range of theories , which limited attempts to bring them together. Eagly and Chaiken (1993) have presented groups of theories in an attempt to make sense of the wide range of theories which have been proposed.

The phrase 'theory of attitudes' raises an important issue: how is the word 'theory' being used? Sometimes, the word is used loosely to imply that which is not practical or that which is speculation. El-Farargy (2007) argued that the scientist uses the word in the sense of an hypothesis: an attempt to bring together observations to make a meaningful whole, with some kind of underpinning rationalisation. Also, this can lead to predictions open to subsequent testing. This is the way the word is conceptualised here although it has to be recognised that the predictive aspect is not yet fully possible.

Over the years, social psychologists have suggested different classes of psychological goals which may be served by holding attitudes. Bohner and Wanke (2002, p. 6) stated that,

> "*Because almost any conceptualisation of attitude function has introduced a different taxonomy, and unfortunately often used the same terms for different concepts or different terms for the same concepts, students often find the whole matter rather confusing. However, social psychologists have not thought about attitude functions in order to propose elaborate classifications, nor did they assume to capture each and every possibly function in their system".*

Also, Eagly and Chaiken (1993, p.1) argued that,

> "*Social psychologists have traditionally assumed that people's evaluations of social policies and other things in their social environment have major consequences. In other words, attitude have been postulated to motivate behaviour and to exert selective effects at various stages of information processing (e.g. attention, perception, retrieval)."*

These quotations illustrate the problem: attitudes have an important meaning both for us and also for other people - they help other people to know what to expect from us (Petty and Cacioppo, 1981, p.8). However, models and theories are complex and diverse simply because the scope of attitudes relating to behaviour is so diverse.

Not only are there too many definitions but there are also too many theories. The range and diversity of theories in the literature is very large and the discussion here will seek only to highlight the main general positions adopted and their significance for education, especially at school level. These will be discussed under several general groupings. Thus, the discussion is not comprehensive but selects only that which is of direct relevance to this study.

2.8 Learning Theories

These theories assume that attitudes are learned and that, therefore, their development will follow the general principles underpinning learning. The learning theories presented are based on an accumulation of empirical evidence and, as with any scientific theory, are susceptible to modification or rejection.

Over many decades, the work of numerous educational psychologists and others has offered key insights into how learning takes place. These models provide a useful framework for research in education. A few are outlined briefly.

Piaget's (1962) insights into intellectual development demonstrated that there are critical aspects of development in learning which occur with age. He offered two key insights: there is a more or less a fixed development and progression in learning up to age 16; thus, young children do not learn in the same way as adults. Secondly, in learning, people are seeking to make sense of their world; in doing this, they construct mental models of reality and these models are their own. Thus, education is not simply a matter of transmitting information from the mind of the teacher to that of the learner. The learners construct their own understandings.

Ausubel *et al.,* (1968) offered two further major insights. They appreciated that what a person knows already has a powerful controlling effect in future learning. This was captured neatly in an information processing model (see Johnstone, 1997) when he appreciated the way the long term memory controlled the perception filter (see Figure 4.1 Information processing model). Ausubel also made a clear distinction between meaningful-rote learning and discovery-reception learning.

The concept of constructivism arose from the insights of Piaget (1962) but is not associated with one specific researcher. Knowledge is not merely transmitted verbally but must be constructed and reconstructed by the learner. Piaget asserted that, for a child to know and construct knowledge of the world, the child must act on objects and it is this action which provides knowledge of those objects (Sigely and Cocking, 1977). This

emphasises that learners construct their own understandings and these may not be correct (in the sense that they are not the same as those held by the majority). Enormous amounts of research have been conducted in relation to constructivism but little has emerged which is very clear cut. This situation is discussed by Kirschner *et al.,* (2006) and they have stated that,

> *"The constructivist description of learning is accurate, but the instructional consequence suggested by constructivists do not necessarily follow."* (p. 78)

Earlier they explain why this is so:

> *"Any instructional theory that ignores the limits of working memory ... is unlikely to be effective."* (p.77)

This leads on to the major insights offered by information processing. This has demonstrated that the rate determining factor in learning (defined as understanding) is the capacity of the learner's working memory. If a task requires more space than is available in the working memory, then learning more or less ceases (Johnstone and Elbanna, 1986, 1989). This led Johnstone on to develop an information processing model (see Figure 4.1 Information processing model) which has been shown to be able to interpret the findings from large areas of learning research as well as be highly predictive (see: Johnstone, 1991; Johnstone *et al*., 1993; Johnstone *et al*., 1994; Johnstone *et al*., 1998; Sirhan and Reid, 2004; Danili and Reid, 2004; Hassan *et al.*, 2004; Danili and Reid, 2006)

Looking at these various contributions in terms of what they offer to attitude development offers some interesting ideas. Firstly, there may be developmental features to attitude growth. Secondly, they stress that attitudes are constructed by the individual learner. They will not exactly reflect the attitudes held by the teacher nor will they reflect what is transmitted in terms of knowledge, affect and behaviour. Thirdly, the work of Ausubel emphasises that the knowledge, feelings and experiences held in long term memory will control new knowledge and this will mean that attitudes already held will affect all future learning. These held attitudes will also control the way attitude relevant knowledge, affect and experience will be allowing to enter the working memory and interact. Finally, the limiting capacity of working memory will be a rate determining step in enabling the learner to understand ideas, mentally 'play' with new and possibly inconsistent information and allow attitudes already held to interact with new input.

Of course, the individual learners will develop their own attitudes in their own way in their own time. This will only happen if the individual learners see some advantage in an attitude change and this leads on the functional theories.

2.9 Functional Theories

The early work of Katz (Katz, 1960; Katz and Stotland, 1959) emphasised that attitudes have a clear function. They contribute in making a person a unique individual; perhaps, they even define individuality. Mostyn (1978, p. 141) notes that attitudes, "*are founded on the basic needs of the individual: loves, self esteem, protection*".

Katz (Katz and Stotland, 1959) defined four functions that attitudes may serve for individual. While these functions imply differing conditions for attitude arousal and change, a given attitude may serve more than one of these functions

> *"(1) Instrumental or utilitarian function recognises that people are motivated to gain reward and minimise punishment.*
> *(2) A knowledge function of attitudes is based on the individual's needed to maintain a stable, organised, and meaningful structure of the world.*
> *(3) The ego-defensive function of attitudes acknowledges the importance of psychoanalytic thought.*
> *(4) The value-expressive function takes into account attitudes that are held because they express a person's values or enhance his self-identity. Readings in attitude theory and measurement."*

Functional theories consider how attitudes and efforts to change attitudes are related to the motivational structure of the individual. Eagly and Himmelfarb (1973) state that

> "*The theories focus of the meaning of the influence situation in the term of both the kinds of motives that are aroused and the individual's method of coping and achieving his goals. In other words, each such theory builds a theoretical structure around the idea that individuals hold attitudes and change them for differing reasons."*

Reid (2003, p. 37) summarises much of the earlier work when he states that,

> *"In general, attitudes in life allow us to:*
>
> *(a) Make sense of ourselves;*
> *(b) Make sense of the world around us;*
> *(c) Make sense of relationships."*

He goes on, in the context of education in the physical sciences, to note that,

> *"Of course, we want our students to make intellectual sense of the world around them - that is the very nature of the subject matter of the physical sciences (and other sciences). Of course, it helps them to make contributions to the understanding of the world if they can also make sense of themselves and others."*

Also attitudes will affect behaviour, influencing what the learner selects from the environment, how they will react to teachers, the materials being used and the other students.

The importance of functional theories is that, in looking at the educational experiences in Libya, the students will have attitudes towards aspects of their experiences which will offer to them an opportunity to make sense of what is happening. Using the Reid (2003, p. 37) analysis above, students in Libya will develop attitudes which help them to make sense of themselves, their potential place in society, their views of learning and the subjects they are asked to study. Attitudes will also develop to help the students to make sense of the world around. This will include their views of their society and the wider world, leading to ways where they see they can make progress and make a contribution as well as attitudes to the major issues on the world stage and how they see their lives relating to these. In addition, the students need to make sense of relationships. This will include relationships within the family, wider society but also relationships between boys and girls.

2.10 Cognitive Theories

Cognitive theories focus on how the person comes to know, what he or she thinks, assuming that these will influence the development of attitudes. Therefore, people who have positive attitudes about an attitude object tend to link it with positive attributes whereas people who have a negative attitude tend to link it with negative attributes (Jung, 2005, p.24).

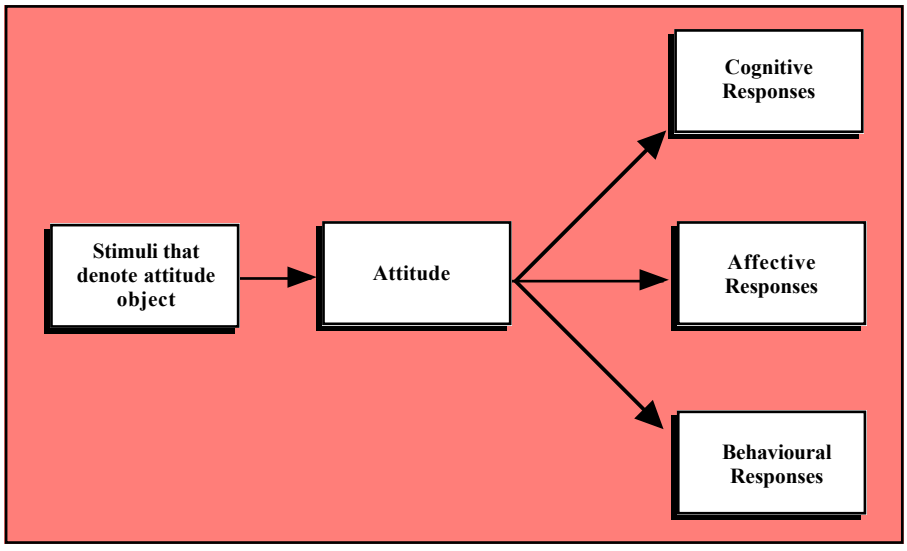


Figure 2.5 Cognitive, affective, behavioural elements of attitude (from Eagly and Chaiken. 1993)

One major contribution in this area has been the work on cognitive dissonance. This is a perspective of human motivation that asserts that it is psychologically uncomfortable to hold attitudes which are contradictory to behaviour. This can be extended to say that it is uncomfortable to hold contradictory cognitions. Indeed, each person tries in some measure to hold attitudes which are consistent with knowledge, emotion and behaviour. This is a position of consonance while inconsistencies generate dissonance. The finding is that dissonance, being unpleasant, motivates a person to change his cognition, attitude or behaviour. Much of this work was carried out by Festinger (1954) although many others have developed it subsequently. Eagly and Chaiken (1993, p. 471) note that "*Researchers have been relatively clever in circumventing this somewhat idiosyncratic definition of dissonance.*"

Festinger (1954) carried out an ingenious experiment where he asked subjects to describe a very boring task in glowing terms suggesting it was extremely interesting. Students received either a low reward or a high reward for doing this. The surprising thing is that those with the low reward changed their views on the task more. Festinger explained this in terms of dissonance. He argued that attitude change was related to *total* dissonance and that total dissonance took into account the amount of consonance. The high rewards were consonant with telling lies about the task, this high amount of consonance reducing the total dissonance.

Festinger believed that dissonance varies in magnitude and is related to the importance attached to the dissonance elements and how strongly the dissonant thoughts conflict. Festinger (1957, pp. 16-18) developed a simple relationship from his results. He described the situation by stating that possible attitude change was influenced by what he called 'total dissonance'. He defined this in a simple relationship:

$$\text{Total Dissonance} = \frac{\text{Actual Dissonance}}{\text{Actual Dissonance} + \text{Actual Consonance}}$$

Thus, total dissonance is given by the amount of dissonance as a proportion of the totals of dissonance and consonance. What he appreciated was that if the actual consonance was large, the denominator becomes large and the total dissonance becomes small.

This makes sense. Faced with some dissonant information or experience, the tendency is for a person to look around for as much as possible which is consonant, thus reducing the total dissonance experienced. Total dissonance is a drive (like hunger, thirst or sex) and the person seeks to reduce the total dissonance in some way.

Looking at Festinger's experiment, Reid (1978a, p. 28) described the situation by stating that *'suppose a person, who believes "x", is forced to state publicly not x"". The two cognitive elements (belief and statement) are in dissonance; the cognitive elements, "not x" are consonant with the pressures or rewards involved in "forcing."'*

Festinger (1954) found that the extent of attitude change was related to the total dissonance and not the actual dissonance. However, total dissonance, if large enough, can also be reduced by:

(a) Changing a cognitive element, or
(b) Removing a cognitive element, or
(c) Adding new cognitive elements.

Festinger (1956, p. 256) put it this way when he suggested that there are three ways to deal with cognitive dissonance. He did not consider these mutually exclusive.

"(1) One may try to change one of more of the beliefs, opinions, or behaviours involved in the dissonance;
(2) One may try to acquire new information or beliefs that will increase the existing consonance and thus cause the total dissonance to be reduced; or
(3) One may try to forget or reduce the importance of those cognitions that are in a dissonant relationship."

Thus, attitude change is not the only possibility arising from dissonance: people can ignore new information, modify it or seek to add to what they know. Although Festinger's results appeared to be counter-intuitive, they do make sense. People accumulate and focus in on aspects which are consistent with their attitudes and views. This generates increased consonance and thus reduces the uncomfortable possibility of having to make an attitude change. Much subsequent work has supported the original Festinger hypothesis**.** **(**Festinger and Carlsmith, 1959; see Reid, 1978a, pp. 27-28**).**

The importance of Festinger's work is that it offers an insight into a *mechanism* by which attitude change and development can take place. It also offers a key to show how attitude development can be encouraged in a school situation. The students need to be placed in learning situations where they face dissonance. In such circumstances, attitude development is a strong possibility. Many years ago, Reid (1980) tested this when looking at social attitudes. He developed a whole series of learning units in each of which he tried to offer experiences where dissonance was likely. Almost all of them involved the students working in groups to have to take decisions where the evidence was not clear cut. He was able to demonstrate large attitude changes in many areas and that these were stable with time (see Johnstone and Reid, 1981).

Most learning in schools and universities does not offer opportunities where dissonance can arise. This is particularly true in the educational context of Libya where teachers adopt an essentially lecturing mode of instruction and the task of the learners is simply to record and memorise. Dissonance is highly unlikely.

2.11 The Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) has gained an increasing interest among science educators as a useful tool for understanding and predicting students' science-related behaviour. Ajzen and Fishbein (1980) have argued that the Theory of Planned Behaviour shows that individual behaviour is driven by behavioural intentions which are a function of an individual's attitude towards the behaviour, the subjective norms surrounding the performance of the behaviour, and the individual's perception of the ease with which the behaviour can be performed (behavioural control).

Ajzen (1991) suggested that the theory is somewhat anomalous given that the theory does not articulate the processes by which people formulate and act. The theory does acknowledge these processes and introduces the behavioural control term that predicts weakened intentions for less controllable behaviours and lowered likelihood of engaging in them.

Ajzen and Fishbein (1980, pp. 4-27) state that,

> *"One of the purposes of the numerous research in the field of attitudes among science educators is in gaining ideal and practical tools for understanding attitudes' science-related behaviour and attracting more students to study science and pursue science-related careers".*

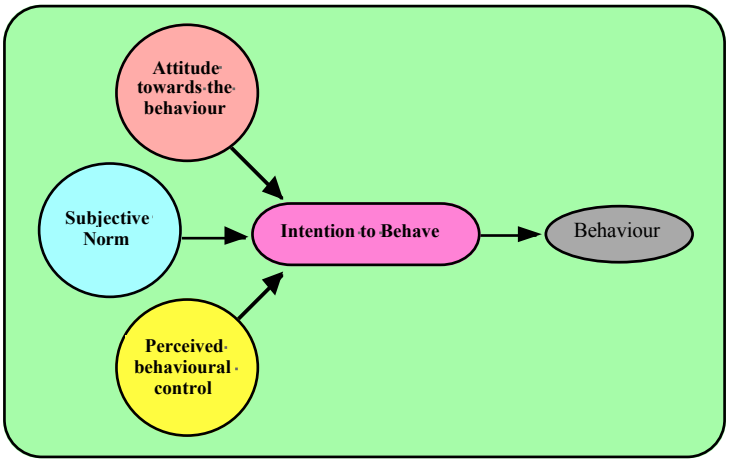


Figure 2.6 The Theory of Planned Behaviour (derived from Eagly and Chaiken, 1993, p. 187)

In simple terms, they indicated that rational planned behaviour is controlled by an intention to engage in that behaviour and this, in turn is controlled by three factors which can be loosely seen as attitudes related to that behaviour, what the person thinks others will think of them engaging in that behaviour (subjective norm) and whether the behaviour is seen as possible (perceived behavioural control). For example, suppose a school student has the choice of taking a physics course the following year. His/her intention to take the course will be influenced by their attitudes related to physics, what they think others will think of them if they take the course and whether it is relatively easy to take the course. The last might be determined by previous marks, feedback on course success rates, time tabling constraints, other potentially attractive options and so on. On the question of taking a physics course, the work of Skryabina (2000) showed that the theory was often a reasonable model of what actually was observed to take place.

The theory replaced and extended the previous Theory of Reasoned Action (Azjen, 1985, 1987, 1988, 1991) which only involved two factors. Although Ajzen maintained that the reasoned action model remains valid for volitional behaviour, he acknowledge that it must be revised to account for behaviours that are not wholly under volitional control. It was revealed that among the three components of the Theory of Planned Behaviour, attitude had the much greater influence in the prediction of behaviour intentions than either subjective norm factor or perceived behavioural control (El-Farargy, 2007). There will be a strong intention to perform the behaviour (e.g. enrol in a college course) when attitudes are more favourable, the subjective norm is positive and there are few perceived behavioural controls. In addition, the degree to which the actual control over the behaviour exists will determine when the person will carry out the intention when the opportunity arises. Finally, given a sufficient degree of *actual control* over the behaviour, people are expected to carry out their intentions when the opportunities arise (Ajzen, 2002).

2.12 Conclusions

The literature about attitudes, their nature and development is simply enormous and it is not possible in the space here to do more than consider a few important aspects. A person's attitudes reflect the consistent ways of anticipating, evaluating and responding to people, ideas, objects and situations. It is important to realise how attitudes are formed and also how attitudes may translate to behaviour and how different strategies can affect attitude formation and behaviour.

The chapter has offered an analysis of definitions and offered an overall view which will be used in this study. Attitudes allow the individual to make sense of this entire world and these attitudes will influence behaviour. Attitudes are highly complex and can affect

learning extensively. This may assist in making learning at school highly successful in terms of developing the potential of the individual student fully or it may hinder learning enormously. Such attitudes are extremely important in developing students who will not only be successful in their studies at school but also be able to continue learning throughout the rest of their lives.

Two further areas need wider exploration. One is the way by which attitudes can be measured and this is discussed in chapter 3. The other is a more detailed look at the way attitudes can be changed, with special reference to school situations. This is the focus of chapter 4.

Chapter Three

Measurement of Attitudes

3.1 Introduction

Attitude measurement is a problem of a great importance for attitude research. Being defined as a latent construct, it is obvious that any knowledge about attitude can only be constructed by inference from the measured responses. In other words, the measurement of attitudes is an area of considerable difficulty.

In the early twentieth century, psychologists adopted a behaviourist perspective. Thus, attitudes, seen as a latent construct, were often judged not be measurable (Reid, 2006). The change from this viewpoint is reflected in the title of Thurstone's early paper of 1929: "Attitudes can be Measured." Nonetheless, there are still dangers. It is possible to define attitudes in terms of what is measured. Thus, Johnstone and Reid (1981) noted that it is possible that "*attitudes are what attitude measuring devices actually measure"*.

Measurement can be seen as the assignment of numbers to observations according to some set of rules. This is true whatever the phenomenon being observed. When that phenomenon is attitude, the process of measurement becomes complicated, since attitudes cannot be observed directly but must always be inferred from behaviour. The difficulty is that the relationship between attitudes and behaviour is complex. There are, of course, many other variables familiar to the social scientist that may be inaccessible to direct observation: intelligence, personality traits, values (see: Summers, 1970, pp. 21-22).

It is important to recognise that attitudes are not directly observable. They must be inferred. It is possible to gain information about attitudes held by simply asking the persons involved. This can be achieved simply by giving them some kind of survey or questionnaire. It can also be done by carrying out interviews. These are direct ways of gaining insights into attitudes in a group of people. Another approach is to deduce attitudes from other observations: by observing behaviour, by observing reactions to alternatives which are presented. This is the indirect approach and the persons involved may not even be aware that their attitudes are being measured.

Reid (2006, p. 3) notes that,

> "*Attitude measurement has had a somewhat chequered history since the possibility of achieving it successfully was demonstrated by Thurstone in 1929. It has been an important area in science education particularly in the context of falling uptakes in the physical sciences in many countries, and there have been many attempts to measure learner attitudes to explore why they were deserting studies in such subjects*."

This not only demonstrates the importance of attitudes work in relation to education but also is a warning that attitude measurement has to be considered with caution.

There is little doubt that attitudes related to all aspects of education at all levels are important and this means that there is need for attitude measurement. This measurement must be able to offer an accurate and valid picture of attitudes and attitude development to a specific aspect of the learning process (see: Reid, 2006, p. 3).

This chapter seeks to offer an overview of the key developments in the field and to indicate how the approaches used in this study derive from the procedures of others.

3.2 Approaches to Measurement

One of the difficulties with all attitude measurement is the tendency to seek for quantification. Summers (1970, p. 42) sees this when he describes quantitative methodology as the "*hallmark of a maturing science*" and considers psychology in this context. Thus, words like quantification, measurement and scaling tend to be used.

Attitudes are simply not easily reduced to a number or a set of numbers. Much research has related to attitudes towards physics (Reid and Skryabina, 2002) but, even here, there are many aspects of such attitudes. This might include such diverse things as attitudes towards the topics in physics, the teacher, the learning experiences, the levels of difficulties, the social relevance and so on. Any attempt to reduce such a wide array of aspects to a number is probably impossible.

Some of this was considered in a review by Schebeci (1984). He expressed the view that (p. 31), "*Attitude research is, in many cases, technically poor*", when considering the psychometric techniques used. He went on to state that, "*Given established methods, why do researchers continue to report studies in which attitude instruments are used which are either clearly invalid or which few data on reliability or validity are reported?*" (p. 43). This illustrates the problem. The methodologies for attitude measurement are open to criticism, especially in relation to education. Frequently, the methods used do not give

clear pictures. Reid (2006) pursues this by suggesting that, "*one of the reasons might be that the scaling methodologies were incapable of producing evidence about the key variables since so much rich detail was lost in the desire to produce a number.*"

Rickwood (1984) illustrates a further problem when he notes that "*in the field of attitude research there exist a degree of divergence of views and opinions over the nature of attitude. The range of opinions that exist over the nature of attitude has failed to produce a clear conceptual base on which the measurement of attitude can be based."*

Thus, two major issues exist:

(a) Finding agreed definitions of what is to be measured;
(b) Finding ways to avoid the tendency to misuse quantification.

The previous chapter tried to address some aspects of the former while the remainder of this chapter explores the latter. This starts by considering the nature of measurement further.

3.3 Variables and Measurement

In a monograph written for physical scientists, Reid (2003) notes that, in educational research, it is possible to see five types of data while, in measurements in the physical sciences, the first two types dominate. His analysis is shown below:

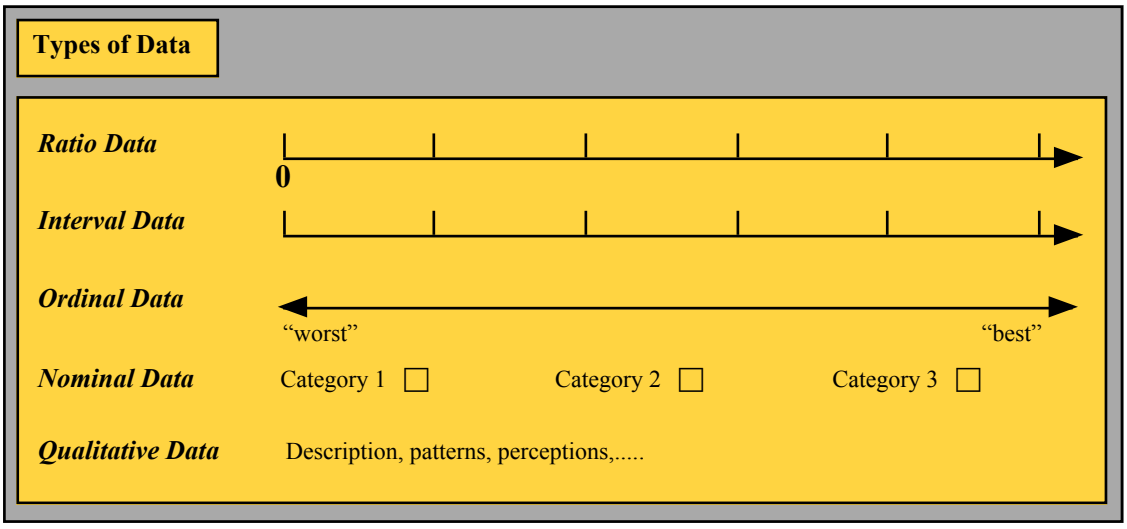


Figure 3.1 Types of Data (source: Reid, 2003, p. 48)

The fundamental problem is that it is not correct to handle the kind of ordinal or categorical data which often arise from attitude measurement using approaches which assume data of an interval or ratio nature. Unfortunately, this is often done (Reid, 2006). Questionnaires often generate data which is ordinal in nature. It is important that this is handled using mathematical and statistical approaches which are consistent with the nature of the data.

In looking at questionnaire design, Oppenheim (1992, p. 21) distinguishes four different kinds of variables:

> *"(1) Experimental variables*. These are the 'causes' or predictors, The effects of which are being studied they are sometimes refereed to as 'independent' or explanatory variables. The analytic type of survey like the lab experiment is set up to vary these factors systematically so that their effects can be observed. Often several such variables working both in isolation and in various combinations are of interest.
>
> *(2) Dependent variables*. These are the results, the effects-variables, the predicted outcomes, these variables have to be measured particularly carefully and group differences tested for statistical significance.
>
> *(3) Controlled variables.* As a source of variation these should be eliminated in order to fulfil the condition of other things being equal when the effects or correlates of the experimental variables are stated.
>
> *(4) Uncontrolled variables.* These are 'free -floating' variables and can theoretically be of two kinds: (a) *confounded variables* and (b) *error*. The confounded variables, sometimes called 'correlated biases' have hidden influences of unknown size on the result."

Inevitably, any research design also suffers from error. Such error variables are (or are assumed to be) randomly distributed or at any rate, distributed in such a way as not to effect the results (see Oppenheim (1992, pp. 21-22).

In the context of attitude measurements, attitudes themselves influence behaviour which itself can sometimes be observed and measured. The problem is to control other variables which might confuse the relationship between attitudes and behaviour. The previous chapter discussed the Theory of Planned Behaviour. This, of course, assumes that the behaviour is planned and under some kind of control. However, it also offers insights into the problem of attitude measurement.

If behaviour intention is being considered in an attitude measurement (say, a questionnaire or interview), then this theory indicates that this is related to three factors, only one of which is attitudinal. One relates to how the person thinks others will view the behaviour while the other relates to constraints on whether the behaviour is possible. If the population being measured are encouraged to be honest and that their responses will not affect anything else (like what their teacher thinks of them or their examination marks), then what others think will not be a very powerful factor. Equally, if the measurement does not involve issues of behaviour constraints, then that factor may also be weak. Thus, the theory does suggest that the measurements (based on behaviour intentions) are likely to be closely related to the attitudes under consideration.

3.4 Scaling Methods

From the earliest days of attitude measurement, attitude scales are described frequently in the literature. The principle behind such an approach is that it is dangerous to rely on a single measurement. Scaling offers a way to bring together several measurements from an attitude questionnaire to give an overall picture. Thus, it is sensible never to rely on one question but to use several. The essential problem is how to bring the responses from several questions together to make a meaningful whole. Scaling is often used and is described here in very general terms by using a fictitious example.

Consider an attempt to measure attitudes towards science with school pupils. 20 statements were constructed and the pupils were asked to indicate the extent to which they agreed with them. The response patterns from each of the 20 questions were correlated with each other and the 10 questions which showed the highest correlation were selected. These were then used in the final form of the questionnaire. Responses were coded using numbers and the total score for each pupil was found by adding up the numbers.

This can be compared to an imaginary test in science. Suppose there are ten questions and the intention is to measure how well a group of students have performed in a range of science skills. The ten questions might test ten different skills. After marking, the marks are added to give some kind of estimation of each student's performance. The test setter would rarely set ten questions which test exactly the same skill. Thus, the performances in the ten questions might *not* correlate highly with each other. The aim is to give some measure of performance in a *range* of science skills. The marks can only be added if the 'value' of a mark in one question is regarded as similar to the 'value' of a mark in the other questions. However, an experienced test setter can ensure that this is likely to be reasonable.

If an attitude measure relies heavily on correlation, then it assumes that the attitude under consideration is *not* multidimensional. This will rarely be the case, certainly in education (see Gardner, 1996; Reid, 2006). If 'scores' on attitude questions are to be added, then that assumes some evidence of an equivalence of mark value from the various questions. This is almost impossible to gain (Reid, 2006). To make matters even worse, most attitude scales rely on Pearson correlation which, by its derivation, assumes some approximation to normality. This is frequently not observed (Reid , 2006).

When attitudes are to be measured by a questionnaire, the thought is that the responses to, say, ten questions, all seeking to offer some kind of measure of some latent construct, can be brought together to give a better measure than that obtained by simply using one question. The problem is how to be sure that the ten questions are, in fact, measuring the *same* construct. Correlation is often used for this purpose but the weakness of this approach has been discussed in some detail by Reid (2006). Things may correlate and yet not be the related to the test construct at all. There is another substantial problem. How can the responses of each of the ten questions be 'added', given the immense difficulty in knowing the *relative* values of the responses.

Scaling underpins numerous approaches (e.g. especially Likert, 1932 and Osgood *et al.,* 1957) and these are now described. However, it is possible to use the structure of questionnaire items (e.g. from Likert or Osgood approaches) *without* employing the uncertain approaches implied by scaling. Scaling is widely criticised and an overall discussion can be found in Reid (2006). Some of these approaches are now outlined.

3.5 Developments in Attitude Measurement

In a Thurstone attitude scale (1928), each respondent marks those statements with which he agrees. Each statement has an assigned value and the score for that test for that respondent is the average scale value of all the statements he/she has endorsed. The assigned value is gained by the use of judges. For an attitude towards some issue, they place values on the statement as to the strength each statement holds with regard to that attitude.

Thurstone is sometimes described as the father of attitude scaling but his method, although ingenious, is time consuming. It is rarely used in this form today. However, his approach led to the ideas developed by Likert (1932).

Likert's primary concern was with unidimensionalty - making sure that all the items would measure the same thing. He also wanted to eliminate the need for judges by getting

subjects in a trial sample to place themselves on an attitude continuum for each statement - running from "strongly agree" to "agree," "uncertain," "disagree", and "strongly disagree." These five positions were given simple weights of 5, 4, 3, 2, and I for scoring purposes (or sometimes 4-0) after more complex scoring methods had been shown to possess no advantage (Oppenheim, 1992, p. 133).

An example of the typical format of this approach is taken from Shah (2004):

Think about your experiences in laboratory work in chemistry.
Tick the box which best reflects your opinion.

	Strongly Agree	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*
(a) I believe that the laboratory is a vital part in learning chemistry	☐	☐	☐	☐	☐
(b) I prefer to have written instructions for experiments	☐	☐	☐	☐	☐
(c) I was unsure about what was expected of me in writing up my experiment	☐	☐	☐	☐	☐

Likert (1932) stressed that it is very important to define the attitude object precisely and to ensure that scales are defined in narrow terms to avoid other dimensions appearing. He did not include neutral items.

The Likert approach is clearly much less laborious than Thurstone's approach. Oppenheim indicates that Likert scales correlate well with outcomes from Thurstone scales (although the weakness of correlation is often ignored - see Reid, 2006). His approach is very popular today and is used widely.

However, there is one disadvantage of his approach which is often ignored. Al-Shibli (2003) has noted that the five point scale is only defined at one end. This means that the 'disagree' end of the scale may be defined differently by different respondents. This problem is resolved by the approach developed by Osgood *et al.* (1957) where both ends of the scale are defined (see below).

Another of the early measures of attitudes was Hammond's (1948) *error-choice* method. In this technique, respondents are presented with questions that they are to answer by selecting one of two alternatives that are provided. Although the respondents are led to believe that the question tests their factual knowledge, neither of the alternatives is actually correct. However, it was argued that the choices made gave some indication of the underlying attitudes held. The method is rarely used today although there are approaches which have been developed which use a similar rating approach although the respondents are not misled about the nature of the test. An example (drawn from Shah, 2004) illustrates this:

Here are several reasons why laboratory work is part of most chemistry courses
Place a tick against the THREE reasons which YOU think are the most important.

Chemistry is a practical subject	☐
Experiments illustrate theory for me	☐
New discoveries are made by means of experiments	☐
Experiments allow me to find out about how materials behave	☐
Experiments teach me chemistry	☐
Experimental skills can be gained in the laboratory	☐
Experiments assist me to plan and organise	☐
Experimental work allows me to think about chemistry	☐
Experimental work makes chemistry more enjoyable for me	☐
Laboratory work allows me to test out ideas	☐

This was part of a much wider questionnaire exploring attitudes towards chemistry laboratory work and was looking to see how students saw the purposes of laboratory work and their attitudes towards laboratory learning. The frequencies of ticks in the boxes gave a pattern which allowed the researcher to determine the order of importance of the various reasons for laboratory work in chemistry. In essence, the original researcher who used this question (Shah, 2004), on careful analysis, saw that three of the responses were much more important. He wished to explore the extent to which the respondents (undergraduates and postgraduate students in chemistry) rated the possible reasons to gain insights into their attitudes to laboratories in terms of what they wished to gain from them. His data offered very useful insights with different populations of such students (Shah, 2004).

Osgood (Osgood, *et al.,* 1957) and his team of researchers were exploring semantic meaning when a method they developed offered some useful insights related to attitudes. They called their approach the semantic differential.

The semantic differential consists of a series of adjective scales, each of which is conventionally separated into six categories. The attitude object is placed at the top of the page and respondents are asked to rate the object by ticking one box on each of the popular scales (e.g. good-bad). An example (drawn from Skryabina, 2000) illustrates the approach:

What are your opinions about University Physics?
Please a tick in one box between each phrase to show your opinion.

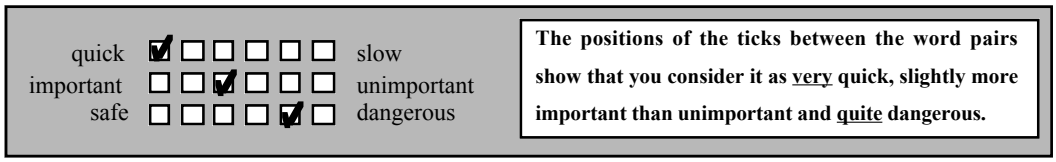
I feel I am coping well	☐	☐	☐	☐	☐	☐	I feel I am not coping well
I am not enjoying the subject	☐	☐	☐	☐	☐	☐	I am enjoying the subject
I have found the subject easy	☐	☐	☐	☐	☐	☐	I found the subject hard
I am growing intellectually	☐	☐	☐	☐	☐	☐	I am not growing intellectually
I am not obtaining new skills	☐	☐	☐	☐	☐	☐	I am obtaining new skills
I am enjoying practical work	☐	☐	☐	☐	☐	☐	I am not enjoying practical work
I am getting worse at the subject	☐	☐	☐	☐	☐	☐	I am getting better at the subject
It is definitely 'my' subject	☐	☐	☐	☐	☐	☐	I am wasting my time in this subject

She used this approach extensively to explore attitudes towards physics at various ages (10 to 20) in Scotland and found it a most insightful technique to gain pictures of the way attitudes were changing with age and stage of education.

There are two major advantages of the approach. The first is that questions can be answered at a very fast rate, thus giving huge amounts of data very rapidly. The second is that both ends of the scale are defined precisely, leaving less room for confusion or ambiguity. However, there is a disadvantage in that there is a limit to what can be placed at each end of the scale. Originally, Osgood *et al.,* (1957) used adjectives and a seven point scale. Reid (1978a) extended this to adjectival phrases. Al-Shibli (2003) used short sentences. However, if the sentences are too long, there is likely to be information overload. Similarly, a seven point scale is probably the absolute maximum which can be used without making such an overload likely. With younger respondents, 4, 5 or 6 points scales might be better.

As with Likert scales, five or seven point scales offer a 'neutral' position. Four or six point scales encourage the respondents to go one way or the other, with no opportunity to 'hide' in a neutral position. There are advantages and disadvantages in both and the choice of scale points has to be determined by age and the nature of the population being tested as well as the issues being explored. In practical terms, instructions need to be given and a typical set used by many researchers (drawn from Reid, 1978b) is shown here:

It is possible to describe a racing car in this way.



Use the same approach to answer the following questions.

The Semantic Differential questions then follow

Eagly and Chaiken (1993, pp. 44-45) describe another approach used originally by Guttman (1941, 1944). He developed a scaling technique that simultaneously scales stimuli and persons. This technique orders stimuli and persons on a single dimension that has cumulative properties. In attitude measurement, this single cumulative dimension would be an evaluative dimension. He believed that if a person agreed with an all inclusive category, they should also agree with varying parts of the category (Mueller, 1970).

A simplified illustration shows how the process might work. A series of statements are placed in order and the respondents tick all those with which he agrees.

1. Abortion is acceptable under any circumstances.
2. Abortion is acceptable in cases of rape.
3. Abortion is acceptable in cases of rape of a minor.

If a person agrees with statement one, they will agree with numbers two and three also while agreement with two implies agreement with three. Thus, the attitude towards rape is indicated by whether there are no ticks, a tick for 3, a tick for 2 and 3 or a tick for them all. Although the idea is ingenious, the approach is not easy in an educational setting where attitudes are so multi-dimensional and rarely have the neat steps as indicated above.

3.6 Measuring Attitudes in Education

Cook and Selltiz (1964) many years ago presented the following approaches to attitude measurement:

"(1) Measures utilising self-reports of beliefs, feelings, of behaviour.
(2) Measures involving observations of behaviour towards the attitude object.
(3) Measures of reactions to or interpretations of relevant partially structured stimuli.
(4) Measures involve psychological reactions to the attitude objects.
(5) Measures of physiological reactions to the attitude objects."

It is important to recognise that attitudes are directed towards a target, often described as an attitude object. The target may be a person, a situation, an educational experience. Indeed, in education, there are probably three general targets or objects: attitudes towards:

Subjects being studied (like physics or history);
Study itself in all its dimensions;
Topics and themes being studied (like pollution, democracy)

Looking again at the Cook and Selltiz analysis, the first two on their list are appropriate in an educational setting and are widely used (see Reid, 2003). Either the learners (or their teachers) are asked to indicate their views using a written questionnaire or they are asked their views by means of an interview.

It is important to recognise that both methods are imperfect. There is no certainty that attitudes can be deduced precisely from responses to questionnaires or interview questions. For example, if the respondents suspect that there is some agenda, they might offer answers which they think will be seen as desirable. Equally, respondents may offer

answers which reflect what they would like a situation to be rather than what it actually is. This has been described as the reality-aspiration problem and may be particularly important with younger respondents (see Danili, 2004). Some of these issues will be discussed later when looking at validity and reliability.

3.7 Questionnaires and Interviews

Oppenheim (1992, p. 100) points out that a questionnaire is,

> "*Not some sort of official form, nor is it a set of questions which has been casually jotted down without much though. We should think of the questionnaire as an important instrument of research, a tool for data collection. The questionnaire has a job to do: its function is measurement."*

He argues that the questionnaire is an important method to collect data and that a well-constructed questionnaire will leads to what he describes as 'good results'.

Questions used in a questionnaire can be closed or open: "*A closed questionnaire is one in which the respondents are offered a choice of alternative replies."* (Oppenheim 1992, p. 112). A closed questionnaire is quicker to answer and easier to analyse than an open one where the respondents have to create their own answers. However, closed questionnaire restrict the respondent's freedom by giving them no choice to develop their answers.

Open questions are sometimes called free-response and "*are not followed by any kind of choice, and the answers have to be recorded in full*' (Oppenheim 1992, p. 112). The open questionnaire gives more freedom to the subject to express fully their opinions. Ideally, a mixture between these two kinds of questions might be seen to be best but this is not always possible to use.

Oppenheim (1992, p. 45) asserts that no other skill is,

> "*As important to the survey research worker as the ability to conduct good interviews*."

He adds that the interview,

> "*Unlike most other techniques requires inter-personal skills of a high order, putting the respondent at ease asking questions in an interested manner, noting down the responses without upsetting the conversational flow, giving support without introducing bias*."

Compared to questionnaires, the interview can give more freedom to both the interviewer

and the interviewee to express freely and fully their opinions. There are two types of interview:

Exploratory interviews: these are also called in-depth interviews, or free-style interviews. The purpose is to develop ideas and research hypotheses rather than to gather facts and statistics. It is concerned with trying to understand how ordinary people think and feel about the topic of concern to the research (Oppenheim, 1992, p. 67). Oppenheim further argues that it is essential for the exploratory interviews to be recorded on tape. Subsequent analysis may be important to pick up on essential details.

Standardised interviews: these are essentially designed for the purposes of data collection. Examples include public opinion polls, research and government surveys. The purpose of standardised interview is to collect the data and the same questions, in the same order, are asked of all respondents. This might be seen as something like a verbal questionnaire.

In educational research, exploratory interviews are very useful while data gathering interviews are often neither totally open or totally unstructured. If interviews are ***highly structured***, then all the questions are decided beforehand. Such an interview can be issued for data collection or can offer some kind of check for misunderstanding and misinterpretation with a questionnaire.

Reid describes a totally open interview and suggests it,

> *"can be built around a question like: 'How did you find the physics laboratories this year?' or 'Tell me what you find the best way to learn organic chemistry?' Some preliminary questions may be needed to develop the levels of confidence and trust to enable the student to talk freely and openly. This type of interview is unpredictable and can be long. However, the insights gained can be very rich with an experienced interviewer who can encourage the students to talk freely."*

However, it will be difficult to summarise and link response to those from other respondents.

Interviews can be highly structured, totally open or anywhere in between.

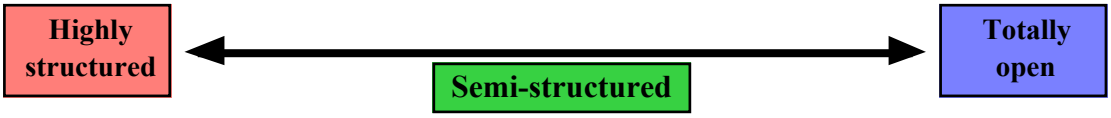


Figure 3.2 Types of Interview (source: Reid, 2003, p. 29)

However, interviews can be semi-structured, with some fairly well defined questions but with freedom to expand and explore in many directions. This allows the respondents some freedom but, if conversation is a problem, the interviewer can move on to the next question.

The type of interview to be conducted depends very much on the purposes in the research. In some cases, interviews will be exploratory because the need is to explore. Others will be confirmatory in that the need is to confirm other data. Looking at questionnaires and interviews, the latter are much more time consuming to undertake and the data may take many hours (for just one interview) to analyse and collate. However, interviews offer very rich data and are often used in conjunction with questionnaires.

3.8 Validity and Reliability

When any measurement is made, it is important to know whether the measurement reflects what is intended to be measured and whether the measurement is accurate. Thus, for example, if a test of mathematics is set, then it is important to know if the questions asked reflect the mathematical skills which the tester wants to measure. It is also important to know if the test will give similar results when used on different occasions. This is parallel to a measuring tape being used to measure the height of people. It is obvious that it can be used to measure the height, provided the person stands vertically and the tape is used vertically as well. It is also obvious that a metal tape is likely to give an almost identical result on two different occasions (provided that the two occasions are not too far apart allowing the person to grow and that the measurements are made at approximately the same time of day as people often shrink slightly throughout a day).

The latter is known as the reliability of the measurement and is partly a reflection of the accuracy of the measurement. It is important to know the conditions under which reliability is more likely (for example, in the case above: the two occasions are not too far apart allowing the person to grow and that the measurements are made at approximately the same time of day as people often shrink slightly throughout a day). The other aspect is validity: does the test measure what it is intended to measure? This is much more important (see Eagly and Chaiken, 1993, p. 42).

There are many uses of the word reliability in the literature. Oppenheim (1992) cites two. One is described as unidimensionality, homogeneity or internal consistency. This is the situation where, for example, ten questions are asked and it may be important to know the extent to which these questions are related to the same latent construct. This can be very important in psychological or sociological research. However, in education, it is rare to

want to ask ten questions which explore the same thing: no one would set a test of mathematics where each of ten questions explored the same skill.

The other is consistency: will the test give similar results on two or more equivalent occasions. Osgood *et al.* (1957, p. 126) state that "*The reliability of an instrument is usually said to be the degree to which the same scores can be reproduced when the same objects are measured repeatedly*" and this summarises the idea nicely. This is much more important in education. In tests and examinations, results may determine the next stage of learning for an individual. It is very important that the results do in fact reflect the actual abilities of the learners and are not dependent on some external circumstance in a particular testing procedure. With questionnaires, if they are carefully constructed and of reasonable length and are applied under circumstances where honesty is likely (the respondents do not consider there is a hidden agenda) and the sample size is large, then reliability is very likely to be very good. Reid (2006) offers evidence to support this and clarifies the inappropriateness of looking for internal consistency in an educational setting.

Validity is much more important and more difficult to achieve**.** The validity of an attitude scale refers to the extent to which the measure truly measures the attitude it is intended to assess (Eagly and Chaiken, 1993 p. 28). Ideally, validity is found by seeing how the measurement relates to alternative measures of the some attitude. However, this is rarely easy to achieve. Oppenhiem (1992, p. 162) lists many kinds of validity and these are now summarised:

> *Content validity*: do the items in the measurement test or reflect some kind of balanced coverage of the issues, skills or knowledge to be measured ?
>
> *Concurrent validity*: do the outcomes of the measurement relate to some other well-validated measures of the same topic, theme or skills?
>
> *Predictive Validity:* do the outcomes of the measurement relate to some future criterion such as job performance, recovery from illness or future examination attainment.
>
> *Construct Validity*: do the outcomes of the measurement relate to some set of theoretical assumptions about an abstract construct.

In looking at questionnaires, the issue of validity is not easy. Clearly the questions used must reflect accurately the issues being explored. There needs to be clarity and absence of ambiguity. In designing a questionnaire, many questions must be developed and then these questions need to be looked at carefully by those who know the issues being explored and know the population being tested. Ideally, pre-testing is useful, with follow up interviews to check if the questions are being understood in the way intended. Another approach is to carry out formal interviews to see whether the outcomes of the questionnaire are matched by the outcomes from the interviews.

3.9 Methods Used in This Study

The aim of this study is to explore what is going on in the Libyan educational system (Middle and High Schools) in a country where the whole system has expanded at a very fast rate and is showing some signs of stress. The students are the key. The education provision is for their benefit and, therefore, the measurements will focus on their attitudes and perceptions at various stages in their educational progress. An overall picture is wanted. There is no attemPt to look at individual students as this is seen as inappropriate given the difficulties in measuring attitudes.

For this purpose, questionnaires offer a useful way forward. Much data can be gathered quickly from large (and, hence, typical) cross sections of the population at various ages and stages. Of course, validity needs to be checked and, for this purpose, sample interviews may be useful.

Both Osgood's (1957) and Likert's (1932) methods will be employed to measure students attitude towards learning and studying in their curriculum as well as wider aspects of their school experience. The ultimate aim of the application of these approaches is to obtain a general view about the factors influencing learning at school and their impact on student's attitude.

The traditional methods used for scoring the data obtained from Likert and Osgood questions have been widely criticised (Gardner, 1975; Gardner 1996; Reid, 2006). The attitudes under consideration are likely to be highly multi-dimensional and thus the use of correlation, seeking internal consistency and adding up ordinal data is highly inappropriate in this study.

It is also important to recognise that attitudes cannot be measured (with present techniques) with any degree of *absolute* certainty. An absolute measurement cannot be obtained. What is possible is to measure large statistical samples and to look for patterns with different groups at different ages and stages.

In this study, the aim will be to compare various groups as they respond to a set of questions. Each question is considered on its own and the patterns of responses from different groups can be compared using the chi-square statistic which has no limitations

due to distribution assumptions. In the first survey, the aim will be to gain an overview by comparing student attitudes at various ages from 12 to 20. The second survey will look at the final two years of schooling to see how the students think when looking backwards. The third survey will then explore the age of decision (bout 15-16) when students have just taken their curriculum decisions.

3.10 Some Conclusions

It has to be recognised that attitudes are examples of latent constructs and have to be inferred from other measurements. In an educational setting, the use of questionnaires and interviews offers the best way forward and this approach was adopted in this study.

Scaling methodology was rejected for this study. It assumes that there is a latent construct whereas, in education, attitudes are multi-dimensional. The scaling method also assumes normal distributions, assumes that ordinal numbers can be treated as integer numbers and, frequently, depends on an inappropriate use of statistics. In this study, each question was analysed on its own.

An important aspect of all attitude measurement is that attitudes cannot be measured in any absolute sense and that means that they cannot be measured for an individual (see Reid, 2006). What can be done is to measure attitudes for large samples and then compare the outcomes from these samples. Thus, attitudes of boys and girls can be compared; or, the development of attitudes with age can be considered by comparing the outcomes from questionnaire responses applied to different age groups as they move through their educational journey.

The types of question suggested by Osgood *et al.,* (1957) and Likert (1932) as well as some questions involving respondents rating responses in some way are the most useful for attitude measurement in an educational setting and these were used in this study.

Validity can be checked by consulting those who know the population well as well as by using some interviews. These procedures were adopted in this study. Reliability was assured by taking large samples and ensuring that the questionnaires were applied under appropriate conditions where the respondents did not feel that there was any pressure to give ‘desirable’ answers.

Chapter Four

Attitude Change

4.1 Introduction

The last two chapters have considered the nature of attitudes in educational settings as well as approaches to attitude measurement. The literature relating to attitude change theory is large, difficult and often contradictory. This is largely because the area is so diverse. This chapter will discuss the way attitudes develop and change in an educational setting from the perspective of the teacher, student and the mechanisms which might be involved.

How are attitudes changed? This question is of practical importance to people who are concerned with such things as advertising, propaganda, as well as education. The range of attitudes is very large and this is reflected in the many models which exist in the literature.

Many years ago Insko (1967) classifies theories of attitude change into thirteen different types, but many of these incorporate several related theories. It is impossible to derive a general theoretical position at the present time because the theories vary in their definition of attitude, the attitude measures used in experimental situations, the settings they seek to explain, and the extent to which they are based on experimental evidence.

Many years ago, Reid (1978a, p. 21) noted that,

> *"In reviewing the attitude change literature, it soon become clear that there are many theoretical frameworks. This is brought about by the range of different understanding of the word 'attitude' and the wide range of situations in which attitudes are important. But, there are too many theoretical frameworks, and in particular, too many of them in (any) one area."*

The problem identified many years ago by Reid is not easy to solve. At that time, there were few attempts to bring the various understandings together into some kind of coherent whole. More recently, Eagly and Chaiken (1993) have grouped the theoretical models into categories and offered a good overview of the area. In addition, the acknowledged stability of attitudes has to be seen alongside the vast industry of advertising where the aim is to change the opinions of populations towards the purchase of some product, or the commitment to some viewpoint which will lead to a vote for a particular political party.

Considerable energy and effort is expended in attempts to change attitudes. Thus, for

example, television advertisements are designed very often to change attitudes towards various products in order to increase sales. Some of them are simply informative. Others associate certain products with attractive possibilities including sex, glamour, popularity and status. Similarly, there are many campaigns seeking to change the attitudes of sections of the population in relation to the abuse of tobacco, alcohol or drugs. In order for such interventions to be successful, there is a need to know the general principles which govern attitude change and development. This chapter offers a summary of some of the literature in this field, focussing particularly on implications in educational settings.

In the literature of attitude change, a number of words and phrases can cause confusion. Firstly, 'attitude change' can carry overtones of things being done to people against their will. None is intended in psychological research although the same might not be true for all advertisers! Similarly, psychology papers often use the word 'persuasion'. This word also carries no overtones of manipulation but simply describes the possible effects of some communication (often described as a 'message') on attitudes held by hearers.

According to Oskamp (1991) attitudes can sometimes change very rapidly while in other situations they may prove very resistant to change. It is the goal of theories of attitude change to define the conditions under which attitudes will change and the ways in which this will occur. In an educational setting, it is perhaps important to think in terms of attitude *development*. In this, students are developing their attitudes towards learning, what is learned and the implications of their learning in society. None of this is prescribed or imposed. Nonetheless, it is desirable that students develop attitudes built on sound evidence and balanced awareness of all the issues. This is very much the role of education: placing learners in learning situations where they can experience and think about all the perspectives and issues and thus be informed, leading to the development of beliefs and attitudes built on a sound cognitive base.

Attitudes also can be changed in many ways under diverse circumstances; and implied in any discussion of "persuasion" is the goal of establishing in a person an attitude where one did not previously exist, or, more commonly the goal of changing, modifying, or shifting an attitude that already exists (Rajecki, 1990). A further implication is that the attitude advocated by some communication has to be discrepant to some degree from the existing attitude, for if it were not different there would be no possibility for attitude change. This notion raises theoretical and empirical questions as to just how much discrepancy produces the most change. In addition, Rajecki (1990, p. 306) observes that there are four basic essentials related to attitude change:

"(1) The persuasive communication that is employed must be strong enough to have a significant initial impact on attitudes.

(2) There must be a discounting cue powerful enough to inhibit significantly the amount of change in attitude that would otherwise be caused by the message.

(3) The discounting cue and the message conclusion must have time to become disassociated before the subsequent (second attitudinal) measure is taken

(4) The level of attitude in a message-only (no discounting cue) control group must be higher at the time of the subsequent (second) measure than is the level of the discounting cue group immediately after exposure to the message. In other wards , the cue and the message have to be disassociated quickly enough so that the message still has some impact when disassociation occurs."

Attitude can be defined as a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour. More succinctly, an attitude, can also be described in the context of evaluative meaning. All knowledge, feelings and behaviour give the opportunity to be evaluative, the development of an attitude being some from of expression of that evaluation (see Reid, 2006).

Psychologists have typically assumed that, to predict the extent to which attitudes will change, researchers must understand the psychological processes that underlie attitudes and their change. Therefore, theories of attitude change generally follow from assumptions that certain cognitive, affective, or motivational processes mediate such change.

In reviewing the literature, the approach adopted here (based partly on Eagly and Chaiken, 1993) is to consider attitude change firstly from the perspective of the person who does the persuading, and then, secondly, consider the person who has to process the persuasive message. Finally, the internal mechanisms by which attitude change may be occurring are discussed.

4.2 Persuasion Approaches

According to Skryabina (2000, p.15) "*Persuasion as a normal English word has overtones that almost make it manipulative. The word is used in psychology without these unacceptable overtones"*. The reason for this enormous interest towards attitude and persuasion is in the presumed ability of attitudes to predict and direct behaviour. Persuasion can be defined as "*human communication designed to influence others by modifying their beliefs, values, or attitudes*" (Simons, 1976, p.21). While O'Keefe (2002, p. 25) observe that, "*Attitude change will often, but not always, be the persuader's goal"*

Brock and Green (2005, pp. 1- 3) also state that,

> *"The key targets of persuasion are our attitudes and opinions These include attitudes toward political candidates, social policies, organisations, persons, consumer products - you name it, we have attitudes toward it. Those who seek to persuade us seek to create or to change our attitudes in a particular direction. Also persuasion's powerful forces are constantly remaking us into persons who are irrevocably changed - sometimes imperceptibly, often dramatically. Persuasion processes are at the heart of social movements and social upheavals."*

The reinforcement theory of attitude change has received greatest emphasis from the work of Hovland and his associates in the Yale Communication Research Programme. The theory as set forth by Hovland, Janis and Kelley (1953) draws mainly upon the principles of learning developed by Hull (1943) and is adapted to complex forms of social behaviour by Miller and Dollard (1941) and by Doob (1947). The essence of the theory is that attitude change results from learning produced though reinforcement.

The Yale team saw learning as underpinning the development of new opinions as well as various verbal and motor skills but they maintained, however, that the type and conditions of learning are quite different in the case of opinions. Insko (1967) has argued that the typical lecture type learning involves a whole series of propositions and ideas while the material to be learned in a persuasive communication is typically a single conclusion or proposition.

Acceptance of new attitudes depends on who is presenting the knowledge, how it is presented, how the person is perceived, the credibility of the communicator and / or the conditions by which the knowledge was received. According to the cognitive response model which was developed from the Yale research, people actively relate information contained in a persuasive communication to their existing beliefs about the message topic.

Ideally, persuasion researchers have quite naturally placed considerable research attention on the question of how various characteristics of the communicator influence the outcomes of the communicator's persuasive efforts. Such research is focussed on particular communicator's credibility, quality and clarity.

4.2.1 Communicator credibility

Credibility (or, more carefully expressed, *perceived* credibility) consists of the judgements made by a perceiver (e.g. a message recipient) concerning the believability of a communicator. Communicator credibility is thus not an intrinsic property of a communicator: a message source may be thought highly credible by one perceiver and not at all credible by another. However, this general notion of credibility has been given a somewhat more careful specification in investigations aimed at identifying the basic underlying dimensions of credibility.

The direction of credibility's effect is not constant and several investigations have found that, at least sometimes, low-credibility communicators are significantly more effective than ones (Bock and Saine, 1975). Thus, in an educational setting, the teacher is the central communicator. It is important that the teacher has high credibility although it has to be recognised that there are other factors and, on some occasions, these may dominate.

One important aspect of credibility will be the willingness of the teacher to engage in developing learning situations where the attitudinal dimension is an integral part. Thus, the teacher who sees his/her role simply in terms of information transfer will generate, implicitly, attitudes towards the importance of knowledge and the importance of the evaluation of that knowledge in attitude terms.

Specifically, the impact of communicator credibility appears to be when the identity of the source is withheld from the audience until after the message has been presented (e.g. Greenberg and Miller, 1966; O'Keefe, 1987). Also, the size of the effect that communicator credibility has on persuasive outcomes is not constant but varies from one circumstance to another.

Researchers have identified at least two factors that affect just how consequential a role communicator credibility plays in persuasion. The first is the degree of direct personal relevance that the issue has for the receiver. As the issue becomes more personally relevant for the receiver, variations in the source's credibility make less difference; under conditions of low personal relevance, the communicator's credibility may make a great deal difference to the outcome, whereas, on highly relevant topics, the source credibility may have little impact (Johnson and Scilppi, 1969). The second factor influencing the magnitude of credibility's impact is the timing of the identification of the communicator. Often, of course, the communicator's identity is known before the message is received by the audience (e.g, because the communicator is well-known and can be seen by the audience or because another person introduces the communicator).

In an educational setting, the teacher's credibility (or otherwise) will be well established. However, the relevance of what is being taught may not be easily perceived by the learners. Thus, in terms of attitude development, the teacher credibility may be critical in enabling attitudes to develop.

In general, Hargreaves (1972) argued that, '*Education is concerned with the changing of attitude*'. It almost seems as if he and other writers believe that, without changes in attitudes there can be no education but this argument is difficult to sustain. Halloran (1967) indicated that attitude change depends upon several factors . Three of the most important of these are :

(a) The perception of the person presenting the information by those receiving it;
(b) The form in which the information is given;
(c) The characteristics of the people who are receiving the information.

Shah (2004, p.67) has stressed that one of the most significant factors appears to be the credibility of the communicator: in his case, the chemistry teacher. At school level, the pupils' perception of the teacher may be influenced by several factors. Two of the most important are : the pupils' previous experience of chemistry teachers and teaching. These may have encouraged the development of certain expectations towards the present teacher. Secondly, the underlying and strong attitudes which are held about teachers and schools in the community or society will be important. In her large scale study, Skryabina (2000) found that two of the three important factors which attracted pupils into physics were their experience of the subject in the classroom and laboratory (what could be called the curriculum quality) and the teacher. This is very similar to what Shah found.

4.2.2 Argument Quality

One aspect that has been investigated extensively is the manner of attitude formation (Fazio and Zanna, 1981). On the one hand, attitude formation is through direct behavioural experience with the attitude object and, on the other hand, attitude formation is through indirect non behavioural experience with the attitude object. For example, a teenager may form an attitude toward a computer game by playing with the game (direct experience) or on the basis of a friend's or an advertisement's description of the game (indirect experience).

Petty and Cacioppo (1986b) developed an elaboration likelihood model relating to attitude change as a result of communication. In simple terms, thinking through a communication carefully is cognitively demanding and it is less demanding to look for external cues and

allow these to influence thinking. As part of their study, they considered a construct which they called *argument quality*. Their model defines this variable in empirical terms and also features a method for generating high and low quality messages. Argument quality refers to a recipient's perception that a message's arguments are strong and cogent as opposed to weak and specious.

Some kinds of attitudes appear to be stronger than others (Petty and Krosnick, 1995). In this context, the word *stronger* is not used in the sense of attitude being more extreme. Instead, stronger refers to the apparent influence that the attitude has on an individual's behaviour.

In addition, two classes of individuals have been considered : those who are aware of and guided by their internal feelings and those who tend to rely heavily on cues in the situation to decide how to behave. In general, people who are aware of their feelings display greater attitude-behaviour consistency than do people who rely on situational cues (Brock and Green, 2005).

Germann (1988) investigated the formation of attitudes towards science in relation to the quality of teaching materials, and teaching environment. He found that students of the teacher with "*better instructional methods and better learning environments had significantly better attitudes than those of the poorer teacher. When the teachers were of comparable experience, the teacher was found to create no significant differences in attitude toward science."* This work supports the results of Haladyna and Shaughnessy (1982) that the teacher and the classroom environment play important roles in affecting pupils' attitudes. However, all of this is totally unsurprising. Better teachers and better teaching generate better attitudes toward a subject discipline! What would have been much more interesting is to explore what *features* of teachers and teaching make it 'better'.

In terms of attitudes towards physics specifically, the work of Skryabina offers useful insights. She was able to show that the way teachers were seen as being willing to support school pupils was critical, especially for the girls (Skryabina, 2000), while the nature of the curriculum was found consistently to be critical for everyone. When the learners saw what they were learning as relevant and related to their lifestyle and context, then they became much more positively disposed towards the study of physics (Reid and Skryabina, 2002a).

4.3 Processing Information

Johnstone (1993b) points out that the perception filter (his phrase) is driven by the long-term memory. In other words, what a person already knows will influence the selection process for new incoming information. This is clearly very important in all learning . Also the working memory is the place where the learner thinks about new information, relates it to previously held information, tries to understand what is incoming as well as making attempts to solve problems Johnstone (1993a).

Halliday and Hitch (1988) state that,

> "*Cognitive psychology has its organisation in the information-processing approach and the assumption that human performance can be analysed by studying inputs and outputs and from this deducing the function of the interring."*

Johnstone (1997) shows that the working space has two main roles: it is the space where information is held temporarily but it is also the space where thinking takes place. He offers a clear picture about the working memory space:

> *"It is the conscious part of the mind that is holding ideas and facts while it thinks about them. It is a shared holding and thinking space where new information coming through the filter consciously interacts with itself and with information drawn from the long term memory store in order to make sense".*

Johnstone was considering learning in a cognitive sense but his findings offer some useful insights into attitude development. His information processing model is shown in Figure 4.1

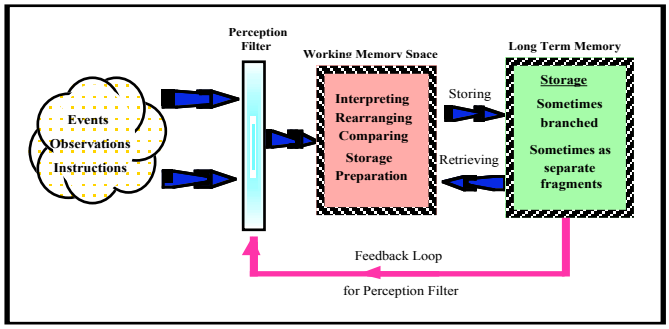


Figure 4.1 Information processing model derive from Johnstone (1997)

Germann (1988) noted that,

> *"The educational process is a social one in which the learners and the teacher come together in an effort to share meaning concerning the concepts and skills of the curriculum".*

This emphasis on meaning is important because Johnstone (1991) has demonstrated the

vital importance of the working memory in reaching meaning and that the way new information is stored and linked in long term memory will depend on what meaning is established. In terms of attitude development, if there is no success in grasping meaning, then evaluation may be very difficult. This will lead to evaluation being based on peripheral cues, a point made by Petty and Cacioppo (1986b).

Far too much teaching and learning is based on the efficient and effective memorisation of information and procedures and its subsequent recall in examinations. This has been demonstrated very recently by Hindal (2007) and Al-Ahmadi (2007). In their studies at different stages of secondary schools, they found that the rewards in examinations were based on recall and recognition. Understanding was rarely rewarded. This makes attitude development problematic. In another recent study (Hussein, 2006), attitudes towards chemistry were found to be very negative with senior school students in a situation where recall was dominant.

Also for an attitude to change, new information (or feeling, or behaviour) must *interact* with what is already held in long memory. This principle was developed by Reid (1980) on the basis of a collation of the research evidence known at that time. He went on to note that,

> *"If such interaction does not occur, then attitude development is unlikely. This level for interaction can occur in situations of cognitive dissonance (this is parallel to cognitive conflict which is being used as a description of cognitive development). It can occur readily in role play. It can occur in certain types of problem solving. It is unlikely to occur in most forms of passive learning. Interestingly enough, essay writing is often not a passive from of learning and attitude development can arise from this".*

Several ideas are implicit in this statement. Firstly, attitudes are stored in long term memory. It means that new information, experience or feelings have to be taken in by the person and then related to what is already held in long term memory. This implies some kind of understanding. If no mental connection is established, then attitude change is unlikely. Reid has identified certain types of situations where this interaction is more likely to occur and this will involve learning situations which are not passive. The learner must be involved with the new material, feelings or experiences.

In a major study involving over 1100 school students, Reid applied these principles and was able to show considerable attitude development (with attitudes of social awareness related to a science discipline) when compared to students being taught in the traditional way (Reid, 1980).

All this demands that new information, experience or feelings have to be processed by the

learner. This will inevitably involve the working memory where understanding and problem solving take place (Johnstone, 1997). If the person is unwilling to take in the new information, experience or feelings, no information is passed to the working memory. If the working memory is overloaded, then understanding may well not take place (Johnstone, 1991) and it is unlikely that the new information, experience or feelings will ever interact with the previously held attitude. Indeed, even if the new input is taken in and understood, it still may not interact with what is held in long term memory. The person may, consciously or subconsciously, keep the new material separate from the old, a process of compartmentalisation (Johnstone, 1997).

4.4 The Formation and the Change of Attitude

The formation and the change of attitude are not two separate things. They are interwoven. People are always adapting and modifying their relationships and attitudes to fit their ever-changing needs and interests. Attitudes cannot be changed by simple education. The task of the teacher is to enable the learner to make sense of what is taught. Some have seen this as simply the transmission of information (Johnstone, 1997). Ausubel (1968) spoke of meaningful learning. Here new ideas are understood and not learned in a rote fashion. However, understanding things, no matter how desirable, does not of itself guarantee any attitude change. An attitude involves some kind of evaluation and has affective and behavioural aspects. Looking at Ausubel's (1968) ideas, understanding of knowledge can be seen in terms of the learning creating a complex matrix of ideas and concepts which are linked together to form some kind of meaningful whole. An attitude change involves a change of evaluation and this seems to require a greater degree of mental interaction between what is held already and what is new which is being processed (Reid, 1980; Johnstone and Reid, 1981).

The sources of the communication are diverse: including friends, family, media, authority figures, people not known personally to the person and, indeed, the attitude object itself. McGuire (1968) noted that, in looking at any communication designed to bring about attitude development, there is a need to consider: attention, comprehension, yielding, retention, and action.

Incoming information and experience may affect the receiver in several ways. The information may simply be a communication of facts or opinions; it may appeal to the emotions of the receiver or it may involve the receiver in certain activities. Traindis (1971, p.142) noted that attitudes may change when:

"(1) A person receives new information from others or the media: Cognitive change.

(2) Through direct experience (involving emotion) with the attitude object: Affective change.

(3) When a person is forced to behave in a way different than normal: Behavioural change."

When information is processed, two routes have been suggested (Petty and Cacioppo, 1986a). In the first route, there is a high motivation to process the incoming information coupled to an ability to process it. This leads to what has been described as deep processing (Cacioppo et al., 1986) and this tends to allow the possibility of more permanent attitude change. This links tightly into the ideas from information processing (see Johnstone, 1991). If the person is willing *and* capable of thinking through the issues arising from the new material, then there is the likelihood of the new information interacting with the formerly held attitudes, leading to the possibility of a permanent change.

On the other hand, if the information cannot be processed (because of lack of motivation or lack of working memory capacity), the processing has to be superficial, never coming to terms with the meaning of the new material. Any attitude change will be superficial. This is all summarised in figure 4.2.

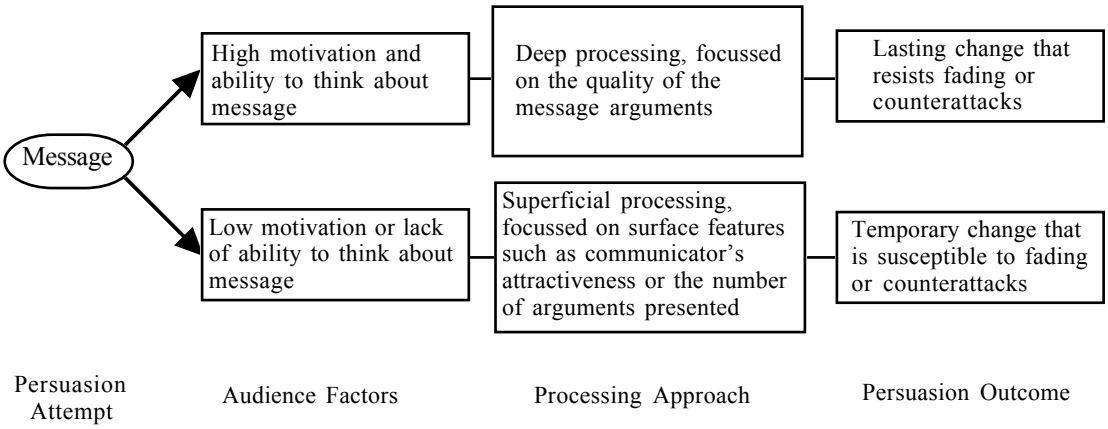


Figure 4.2 Processing Approaches (derived from Traindis, 1946). (http://chiron.valdost . ed./mawwhately/767/attitude.htm)

4.5 Dissonance and Internalisation

The work of Festinger (1954) has demonstrated that cognitive dissonance is a mechanism, in the brain which is important for attitude change to occur. Originally, the dissonance was seen in terms of behaviour and belief. Festinger (1954) considers the human need for consistency between beliefs, affects and behaviour. In simple terms, in trying to make sense of the world in evaluative terms, the human seeks to see things as a coherent whole with the minimum of inconsistency. Of course, humans are not always consistent and live with considerable inconsistency provided that the inconsistent ideas, feelings or behaviours are kept apart in the mind, the process of compartmentalisation (see Heider, 1946).

Thus, a pupil at school can be put into a learning environment which can cause some dissonance in his or her system of cognition (beliefs). For example, a pupil was forced to take a subject which he did not like and his attitude towards the class was negative. Soon after a pupil might find that the lessons were interesting, the teacher was enthusiastic and it was fun to attend the class. The real atmosphere of the lessons does not match the pupil's beliefs about the classes and this may cause dissonance. Working towards restoring a state of balance, a pupil may follow the ways suggested by Festinger for dissonance reduction. The first way will lead to reducing dissonance through changing attitudes towards the subject (from unfavourable to favourable) which may lead to changes in the pupil's behaviour towards this subject. However, if the pupil finds it more beneficial to keep the previously held attitudes (e.g. to be consistent with himself), the behaviour of this pupil in the classes may deteriorate (Skryabina, 2000. pp. 14-15).

4.6 Three processes of Attitude change

Another important aspect of the mechanisms of attitude change lies in the area of internalisation. In fact, there are three processes of social influence which are described in the literature. Kelman (1971, pp. 218-219) describes these as,

> *"**compliance**, which occurs when an individual accepts influence because he hopes to achieve a favourable reaction from another person or group; **identification**, which occurs when an individual accepts influence because he wants to establish or maintain a satisfying self defining relationship to another person or a group; **internalisation**, which occurs when an individual accepts influence because the content of the induced behaviour is congruent with his value system."*

The idea of compliance is not really a target for education in that too easily the attitude might change in a different context where a different person or group was important. Identification is important in that a young person needs to belong, to a family, a culture,

or even a school culture. However, most fundamental is internalisation where the person has made the attitude their own because their evaluation is consistent with other evaluation, knowledge and experience. Internalisation leads to consistent behaviour under conditions of relevance of the issue, largely regardless of circumstances. The attitude can be seen as intrinsically rewarding and it is largely consistent with his value system (Kelman, 1971).

This has huge implications for attitude development in a school setting. It is relatively easy for younger children to form attitudes which reflect their teachers but these may not persist because they have not been internalised. The pupils have to make the attitudes their own. Of course, this is a feature of the teenage years when the internalisation of attitudes to give a consistent attitude framework is developed. These years can be characterised by a measure of rebellion as attitudes, beliefs and, indeed, world views of parents and teachers are rejected or worked through. The aim is to develop a consistent set of personal attitudes which enable the young person to make sense of their world, themselves and of their relationships.

This study focusses on Libyan students, aged 12-20. These are the years of attitude development and attitude internalisation., The student moves from a high dependence on received parental and teacher influences towards a more independent view of life. It is a time of considerable uncertainty and, sometimes, confusion and rebellion. It is a time when there is often a mental battle between the need to identify with a social group conflicting with a need to develop a personal identity. The key feature is that this age range encompasses the period when attitudes are being re-thought and being made one's own.

4.7 Towards a Model for Attitude Change

Following a major study set in schools in Scotland, Johnstone and Reid (1981) considered the question why some attitudes change easily while others do not. Their study looked at the five attitude areas which they were considering and found that four showed changes easily while the fifth was quite different, showing little change in pupil attitudes under similar conditions. Before building up a possible model for attitude change, the main strands for evidence of that time from previous research are summarised by them. Their proposed model attempts to account for attitude stability in normal life as well as the possibility of attitude change brought about experimentally. It also attempts to account for the variable ease of attitude modification, the variation being related to the nature of the attitude. The model is consider to be useful in rationalising a wide range of experimental data, as well as generating further lines of research. In summary they noted that:

"(1) Attitude change normally occurs by small steps (Hovland, 1959; Sherif and Sherif 1967) although, under 'forcing' laboratory conditions, larger changes can occur (see for example, Hovland et.al, 1953, and Festinger, 1957);

(2) Attitude development (or growth) can be thought of in terms of a cumulating of many small steps (Sherif and Sherif, 1967);

(3) Effective attitude change processes appear to be based on the concept of intra-activity;intra-activity is mediated by means of cognitive input (Johnstone and Reid, 1979; Nasr, 1976; Steele, 1979);

(4) Intensity of intra-activity is not easily defined, but it appears that intensity can be varied (by experimenter), and controlled to some extant by the individual (Matefy and Ackson, 1976);

(5) There appears to be a spectrum (or maybe several spectra) of attitudes some of which are amenable to change easily by means of intra-activity, others with great difficulty or not at all (Reid, 1978a).

(6) When cognitively oriented attitudes change, the changes seem to be stable with time (Reid 1978a)."(p.205)

Their use of the word "intra-activity" needs explanation. Derived from a very thorough survey of all the attitude change literature of the day, they suggested that the idea of dissonance could be expanded (bringing evidence from other studies). For attitude change to occur, new input (of any nature) had to 'mentally bump' (their phrase) against previously held attitudes. As attitudes are held in long term memory as a matrix of knowledge, ideas, feelings and experiences, then it was suggested that these had to be disturbed in some way by an interaction between them and new knowledge, ideas, feelings or experiences. This internal interaction was described as intra-activity, emphasising that it happening internally within (intra = within) the brain.

Using this idea, they proposed that there were barriers to hinder this internal mental interaction (intra-activity). This supports the observation that, in real life (compared to 'forcing' experimentation), attitudes are remarkably stable (Hovland, 1959).

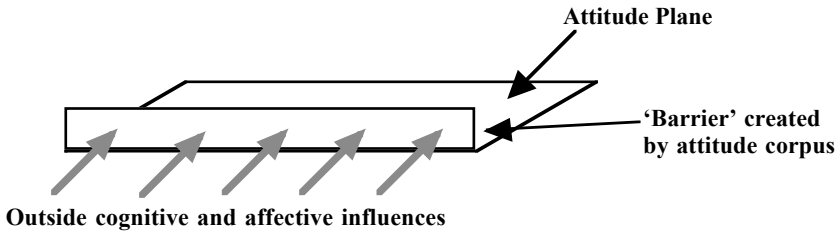


Figure 4.3 Barrier to Attitude Change (source: Johnstone and Reid, 1981)

Johnstone and Reid (1981) noted that the attitudes which were most resistant to change were those which were personal in the sense that they affected the individual's personal

lifestyle more markedly. The more easily modified attitudes were those which were nor cognitive: such attitudes were dominated by knowledge. For example, although not known to them at the time, pupils might have attitudes towards global warming and these might well be open to easy change, given more information and experience. By contrast, when the attitude change involved changes in one's personal life style (attitudes to air travel etc.), then the attitude might be much more resistant to change. They then suggested that the barrier to attitude change might be greater the more personal the attitude was (Figure 4.4).

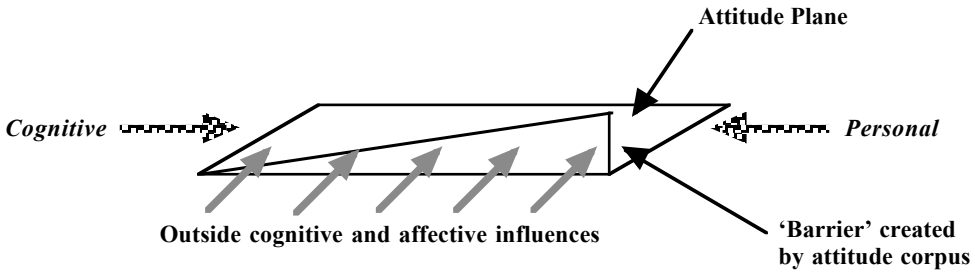


Figure 4.4 Variable Barrier to attitude change (source: Johnstone and Reid, 1981)

This implies a spectrum of attitudes (along a high cognitive to low cognitive dimension), and that cognitive-based attitudes are much more susceptible to change. Thus, it is possible to persuade a person that their attitude to pollution is based on inadequate evidence, and should be modified. However, it is very difficult to bring about religious conversion without very strong cognitive and affective input. The resistance to change here is large simply because the whole lifestyle may be involved.

Having considered the contributions from research in social psychology, their findings can be interpreted in educational settings in order to give a set of principles which will underpin the development of attitudes in school situations. In figure 4.5 some important keys to attitude development are outlined.

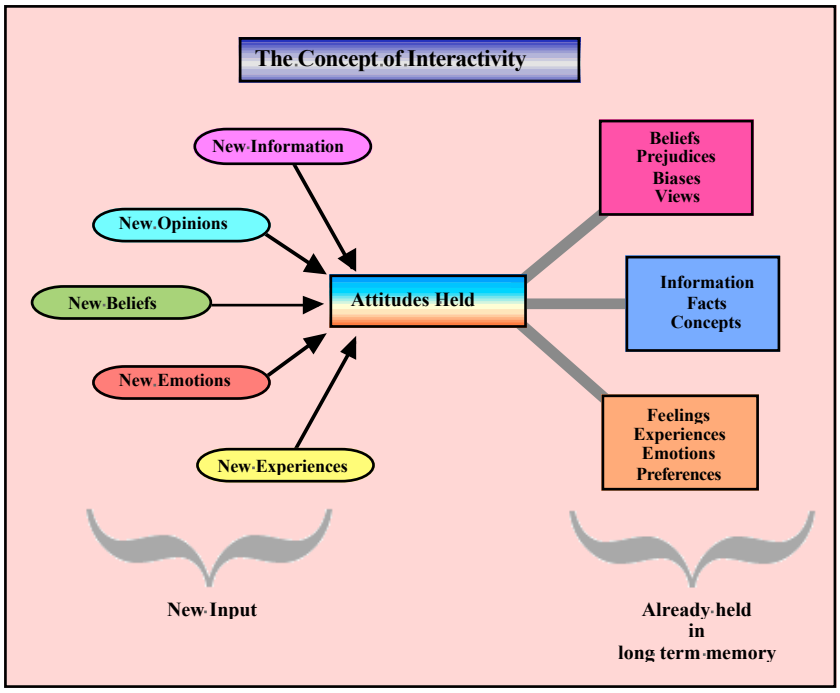


Figure 4.5 The Concept of Interactivity (derived from Reid, 1980)

4.8 Attitudes Development in Education Settings

The development of attitude in any educational process is likely to depend on a very considerable list of factors. These will include:

The subject matter being studied;
The way the subject matter is presented;
The underpinning approaches to teaching and learning;
The overt aims of study held by learners and teachers;
The assessment of achievement.

Above all, perceptions of the teachers about the important of attitude development will be very important. Thus, Reid (1979, p. 4) notes that,

> *"In looking at the attitudes towards the subject being studied, much will depend on the quality of the material being presented, the quality of the teacher(s), the opportunities to apply the material in ways meaningful to the students, as well as the nature and relevance (as perceived by the students) of the assessment. In simple terms, what is to be taught and how it is taught will be the two major influences on attitudes towards the subject being studied."*

Schools are often expected to bring about attitude development by politicians and educational planners. Thus, for example, attitudes relating to race, culture and drugs abuse are seen to be important while attitudes related to scientific thinking and global warming

are also specified. Many of these attitude positions may be extremely important for the individual in the years that lie ahead and it is worth stressing that the development of such attitudes should not be allowed to happen purely by chance if there are ways by which the process can be made integral to the whole learning process (Reid, 1979, p. 3) Sadly, little or no attempt is ever made to bring the results from social psychology to guide the curriculum so that achievements in such areas are more likely. Reid (1979, p. 4) notes that,

> *"To make any major impact on attitude development with students, it is important that some of the major findings from the field of attitude change are considered so that general established principles can be applied to the educational process in a planned way."*

It is useful to look at attitude change from the perspective of the learner and of the teacher and school, and then consider the pupil in the way they respond to the teaching and the internal mechanisms by which attitude change may be occurring.

4.8.1 The Pupil

Quite clearly pupil attitudes must be developed in such away that they provide a satisfactory frame of reference for the students. The idea that attitudes are related to internal satisfaction. Katz (1960) is important. This is probably connected to the dissonance reduction that Festinger regards as central. It is also clearly related to the concept of internalisation, suggested by both Bloom and Sherif (Sherif and Sherif, 1967). If an attitude is to serve the kind of satisfaction-producing function suggested by Katz, then that attitude must become the individual's own attitude is: it must be internalised. In simple terms, for a school student to change an attitude, there has to be some advantage for that student. This advantage may not be clearly seen by the student; it may be almost sub-conscious. However, if attitudes exist to enable individuals to make sense of their work, their relationships and themselves, then there has to be some gain in one or more of these for an attitude to change. Does the new attitude position offer a better understanding or perspective in some way?

4.8.2 The Teacher

The key aspect of a teacher's sense of identity is expert knowledge. Beijaard *et al.,* (2000) investigated this in a sample of secondary school teachers in the Netherlands. They looked at subject-matter expertise, didactical expertise and pedagogical expertise: the teacher not only as expert in terms of what was taught, but also in terms of how it was taught and how the learners understand. They found that most of the teachers saw themselves in

terms of a combination of these identities, although it was interesting to observe that many perceived a transition from subject expertise towards learning expertise as their careers developed.

Although this speaks of concepts and skills, it could equally apply to attitudes. The teacher's influence is powerful. The manner in which the subject is taught, in which the curriculum is presented, and in which the classroom activities are conducted is the result of the knowledge, world-views, beliefs, life goals, life style, needs, skills, and attitudes that the teacher brings to the classroom. Thus, personality of the teacher, his/her competence in the subject, the methods used in the classroom, the ability to motivate and encourage pupils' will influence pupils' attitude towards the subject (Skryabina, 2000).

Furthermore, a good teacher wishes to open and invigorate the minds of the children they teach. They encourage their children to observe, and reflect on their experiences. Teachers must also understand their new roles, use new approaches, and have new attitudes. Indeed, the teacher is a key factor in the classroom, and a vital part of children's learning. Only a teacher with a positive attitude towards his subject can create a good learning atmosphere in the lessons, be enthusiastic, motivated, stimulating and encouraging for pupils. Devlin and Williams (1992) have reported about the vital influence on many of today's leading scientists on school science teachers. It was confirmed that a lack of teachers' interest is one of the barriers to effective science teaching. (Shrigley, 1971, 1983;) Collis, 1993).

Teachers must not merely impart content knowledge. Thus, Board (2000) points out that,

> "*The role of the teacher is to promote and develop autonomous learning in the classroom by facilitating, helping, counselling, co-ordinating, proposing ideas, guiding, and fostering communication"*

However, it goes further. The personal qualities of individual teachers are vital. Loveless (1995, p. 149) observes that:

> *The teachers' beliefs and values about the nature of education and schooling affect how life in the classroom is organised and managed, and the background experience of an attitude to new technology will also affect the role it plays in the classroom.*

There is no doubt that the teacher is absolutely critical in the formation of positive attitudes towards learning, towards the subject being learned and, frequently, towards aspects of the themes being studied. This has important implications. If it is important, for example, to encourage the development of more positive attitudes towards a subject (like physics), then it is of little value trying to influence the learners from outside the school situation. It is much more productive to seek to work with the teachers, to provide

them with support, materials and encouragement. They have day to day contact with the learners and are in the most powerful position to enable attitude development to take place. Equally, there are major implications for inservice training as well as pre-service training of teachers. This means investment into teachers rather than the development of events and activities which are outside the school.

4.9 Attitude Development Through Education

The whole process of attitude development in the context of education can be summarised under five headings (figure 4.6):

Input	What is presented
Reception	How it is received
Attitude Position	Student current attitude position
Processing	How the input is processed
The Change	What gain attitude development offers

Table 4.1 Attitude Development: the Main Aspects

Figure 4.6 summarises the various aspects of the whole process by which some communication is received, processed, related to an attitude position and, then potentially, able to create a new attitude position. The important aspects of input stage are the characteristics of content provided: namely, what is to be presented and how it is presented. No content can influence a student's attitude unless it motivates students to be willing to receive. Therefore, student's perceived relevance of the subject and self-confidence about ability to understand it must be gained.

In the stage of processing, the new input has to be comprehended. Attitude is not merely developed by acquisition of relevant information. It needs to be internalised or "made one's own." Its implications for making sense of the world and for possible patterns of behaviour need to be connected meaningfully to other related attitudes to make a coherent whole. For this reason, students should participate actively in the learning process.

Of course, all these process are considered in relation to student's current attitude position. Jung (2005) notes the need to know the, -

> *"Cognitive and affective baseline;*
> *Established behavioural baseline;*
> *Held attitude position and strength;*
> *The nature of the matrix of cognition's and affects that are embedded in the attitude;*
> *Extent of internalisation;*
> *Extent of ego-involvement."*

Figure 4.7 (below) attempts to summarise the whole picture.

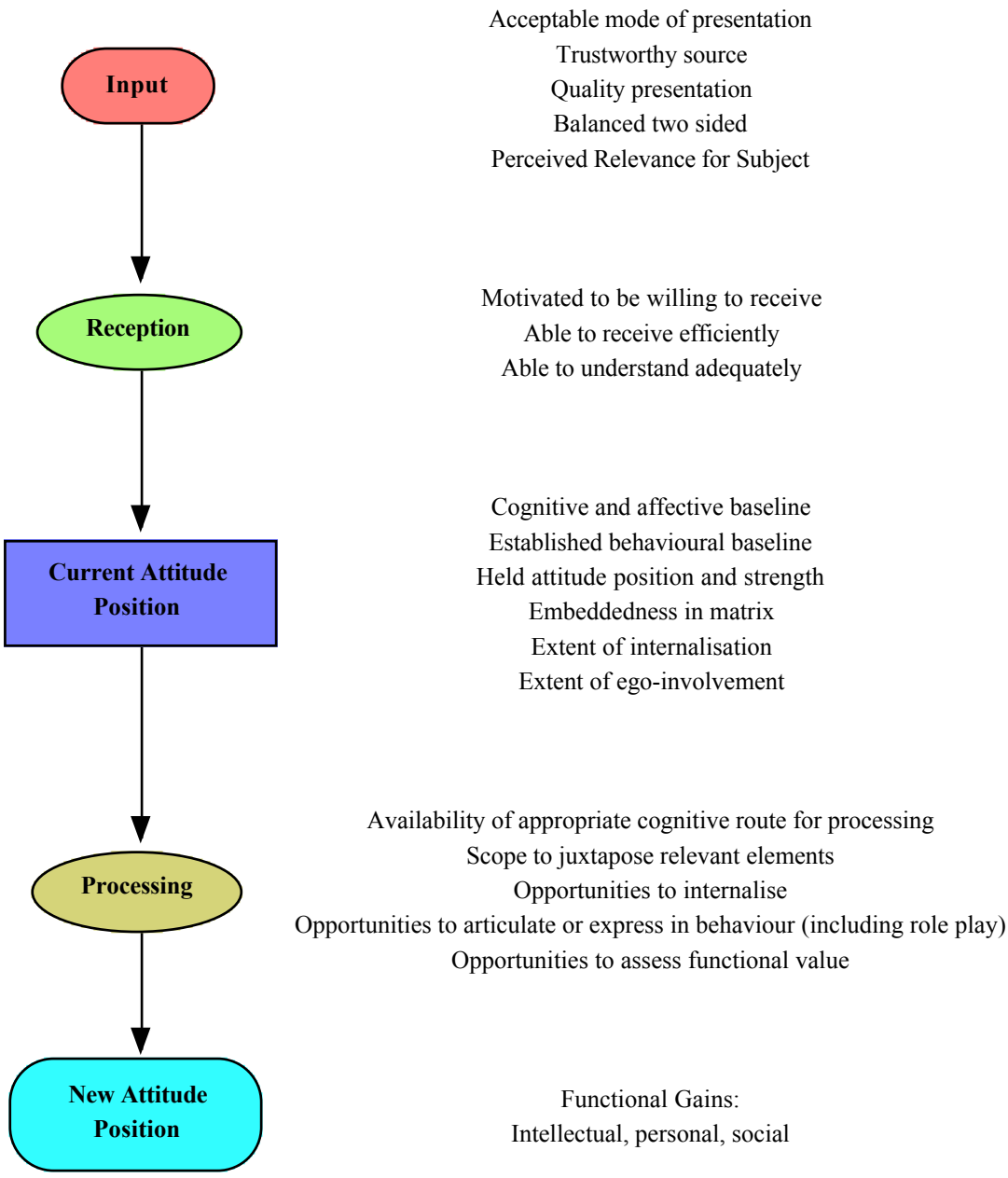


Figure 4.6 Summary of Attitude Development (source: Reid, 2007)

The analysis in figure 4.7 seeks to bring together the main findings from the literature about attitude development, as they might apply in an educational context, using the five stages.

It also suggests the key criteria which must be fulfilled if attitude development is likely to occur. From this wide range of ideas of attitude development, it is possible to list a number of features of curricular strategy that seem to be important to bringing about attitude growth with secondary pupils.

Long ago, Reid (1978a, p. 36) suggested five features about teaching materials to be be

used with secondary pupils when seeking to allow attitude growth to occur:

> *"(1) If attitudes are to develop, cognitive and affective elements must be brought into true juxtaposition in pupils learning experiences; almost certainly, traditional didactic methods will not allow for this.*
> *(2) Attitude development in pupils must be related to attitudes which have a direct bearing on pupils at their stage of growth if any satisfaction and meaning is to result for the pupils learning experiences; almost certainly, traditional didactic methods will be not allow for this.*
> *(3) The cognitive content of attitudes must be stressed, firstly because it is an essential component of full attitude development, and secondly, because it is this content that will appeal to teachers and encourage them to use attitude-teaching materials.*
> *(4) If the attitudes of teachers cannot to be controlled, then attitude teaching materials must be designed to be as teacher-proof as possible; the good teacher will not be hindered, but pupils will be partially protected from the bad teacher.*
> *(5) In designing materials for school use, interactive materials will be necessary; in such materials, opportunity is provided for deep levels of involvement which will give scope for necessary internalisation."*

The study by Reid (1980) used interventions which involved pupil (aged 14-16) participation in new teaching materials which were deliberately designed in line with the five principles. The aim was not to impose certain attitudes but to enable the pupils to develop their own attitudes, based soundly on cognition. This is similar to but not quite in line with what Allport said half a century ago: "*if the school does not teach values it will have the effect denying them"*. (Allport, 1961). Allport is talking of values and teaching them, implying some kind of direction offered by the teacher. Reid (1980) talks of attitude development. However, the emphasis on the importance of such approaches is shared. Both approaches are consistent with Khan and Weiss (1973) who stated that

> *"The belief that a pupil will develop positive attitudes toward subject matter, school. education, the teacher, and others, just by coming to school and interacting with curriculum materials, other students, and the teacher, is an untenable assumption. Education cannot afford the luxury of having its most important affective outcomes occur as accidents or unintended effects of the curriculum and of school life in general".*

The work of Reid (1978a) is very much from an educational perspective and interprets the findings from social psychology into practical teaching situations. The idea of using interactive teaching materials was stressed but he was really talking about mental intra-action, a process by which new input was allowed to interact with previously held attitudinally relevant knowledge. The interaction might be pupil-pupil, pupil-teacher, or pupil-material but what he was seeking to achieve was internal mental intra-action.
The word "intra-action" is used to denote a very deep level of involvement, and has no

connection with ideas of classroom interaction studies. The stress on this arises from studies in which role-play is often used. Indeed Hovland (1957) himself has drawn attention to "active participation" as a possible key to attitude change. Reid (1979) used group decisions taking exercises and role play extensively as approaches to bring about this internal mental intra-action.

4.10 Limitations to Attitude Change

Khan and Weiss (1973) noted the kind of variables which can potentially make an impact on attitude development in a school context. Figure 4.8 is adapted from their work.

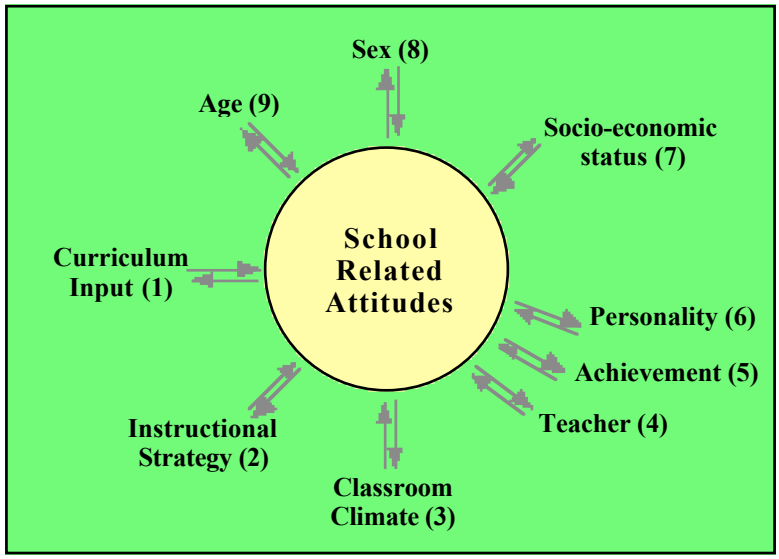


Figure 4.7 School Related Attitudes (derived from Khan and Weiss, 1973)

Looking at these nine inputs, (6) - (9) are essentially unalterable while (5) is not easy to alter and simply cannot be altered for everyone given the present way assessments are used. (3) and (4) might be modified by means of training and researching but these are largely beyond curriculum control. Indeed, there is considerable evidence that teacher ways of thinking are very difficult to modify in that, under the pressures of teaching, they tend to go back to ways of thinking and doing which they experienced in their own education (Carroll, 2005). Very recent work (El-Sawaf, 2007) has identified some of the controlling factors which strongly influence change: the prescribed curriculum and the imposed assessment system.

Thus, the outsider, the curriculum planner, can influence only (1) and (2) in any significant way. However, variable (5) needs re-thought. Achievement will depend very heavily on assessment: what is assessed, when and how, as well as the way assessment outcomes are used. Very often assessment determines what is to be taught and how it is taught. Equally,

assessment may place emphases on aspects of learning which will develop attitudes. For example, if the rewards come from the correct recall of information, then this will influence the learner's attitudes towards learning. Understanding, critical thought, analysis, application of ideas may be devalued in the eyes of the learner and this will influence future learning.

Having looked briefly at attitude development in the school setting, the next stage is to see how these findings relate to what is currently happening in Libya in school education from age 12 upwards.

4.11 Context of Education Provision in Libya

Libya is a developing country and, in educational terms, has changed quite dramatically in the past 50 years or so. Attitudes to education and attitudes arising from school education will be typical of such a situation and will not reflect the kinds of patterns often seen in the developed world.

Compulsory education for the primary and middle school stages only started in 1975 and was later extended through secondary education (ages 18-19 typically). This was fully funded by government who took responsibility for the curriculum and teacher provision and training (Khalifa, 2000, pp. 63-65). Four aspects will be discussed briefly, these being likely to have a major impact on the development of attitudes in Libya schools.

4.11.1 The School Principal

The school principal is the central manager of the school system, administering the curriculum in particular. Principals do not teach but have the duty to encourage others, to listen, to report, to watch, to judge, to criticise, to take decisions and to command. The most important problem is that the Ministry of Education Officials tend to see principals as 'servants of innovation' and not as professionals capable of making sensible decisions themselves. This undermines the relationship between the principal and the teachers, and is counter-productive both to effective school management, and to schools grasping complex initiatives such as curriculum development. The improvement of teaching and learning in school through in-service education demands change in intellectual competence, attitudes, perceptions, conceptions and beliefs (Almansory, 1995; S. P. L. A, 1988).

4.11.2 Role of the Teachers and the Curriculum

In England, Woods and Jeffrey (2002, p. 25) argue that teachers have seen their role reduced to a list of "competencies and performativities". This has produced teacher uncertainty as their role as a professional has been reduced to that of a 'technician'. In Libya, the teacher is often seen in similar terms,

Teachers in Libya do not usually influence curriculum change; it is the responsibility of the government to do so. To teach effectively, teachers must merely understand the requirements of pupils, know the syllabus, and be able to use appropriate teaching methods.

One important responsibility of the teacher is to help pupils to process new material in meaningful ways in order to encourage its storage in long-term memory in such a way that it is understood and is related to previous knowledge. However, the aim is that the learner makes sense of life and can use and apply knowledge in meaningful ways. Indeed, when the school students can make sense and can apply, then there is an internal satisfaction which can lead to positive attitudes (Hussein, 2006).

In Libya, teachers are seen as the sources of appropriate knowledge and skills and their task is to impart these successfully to the students so that they can be recalled under examination conditions. Such a system is likely to develop its own attitudes towards learning. In addition, in Libya, the idea of teachers seeking to enable students to develop attitudes or, indeed, to consider the wider welfare of the students is foreign.

4.11.3 Role of the Parents

The role of the family and parents is critical in all learning. In Libya, parents cannot directly influence what is going on the schools, especially when it involves an academic matter such as curriculum change. This is unlike countries in the West where parents may exert some influence over educational matters (Kelley, 1982). Parents have the primary responsibility to ensure that their children are educated. This means that parents also have the primary interest in what, where, when and how their children are to learn and to be taught. Consequently parents are often made welcome to discuss problems or to help in the classroom and some parents help the schools and their children by providing materials and money to enhance the educational achievement of their children (Khalifa, 2000, p. 65).

4.11.4 Cultural Aspects

Every culture develops its own set of values and assumptions. In any one country or culture, some of this will be held in common but each individual will have a unique set of held knowledge and beliefs that mark him/her out as separate people and personalities. Not only do we sense selectively but we also add, from experience, to our sensory information and amplify an otherwise incomplete sensory experience. Wider culture and experience will influence this.

In other words a culture is not something that is planned, controlled or organised but it is continuously changing. A culture is what people do, the experiences they have, and the values, ideas and dreams they have in common (Leigh, 1995; Ross, 1993). Human cultures vary considerably, one from the other, although different in certain respects, cultures also resemble one another to a certain extent (Hofstede, 1991; Weiss, 1994; Khalifa, 2000, p. 68).

> *"Culture is the sum total ways of living; including values, beliefs, aesthetic standards, linguistic expression, patterns of thinking, behavioural norms, and styles of communication which a group of people has developed to assure its survival in a particular physical and human environment."*
>
> (Chisholms, 1998, p.7)

With a common language and almost totally Islamic, Libya appears socially homogenous. The people are seen as sharing common values, ideologies and needs. Hence, it may be easy to identify the social problems and the actual needs arising, and what their priorities are. The lack of social differences means that there will not vast differences in the way in which people will react to a suggested educational innovation,

At the time of independence in 1951, Libya was one of the poorest countries in the world, with few known natural resources, and a population that was small, poor and illiterate. Since 1963, Oil revenues have allowed the rapid development of education. Thus, education is seen as relatively new, is valued as it is seen as opening doors to new opportunities and secure employment. Girls and women fifty years ago did not have equal opportunities and this influenced education.

The common language and religious cohesiveness has generated separate schooling for boys and girls, separate schooling for various subject areas, strongly didactic traditions, examinations based heavily on the recall of vast amounts of content, as well as powerful family influences strongly directed by the father and the need for behaviour patterns consistent with the teaching of Islam. In all of this, Libya can be seen as typical of many Arabic speaking countries and, inevitably, this underpins attitudes towards education, towards learning and towards the themes covered in school syllabuses.

4.12 The Educational Process

The development of attitudes in any educational process is likely to depend on a very considerable list of factors. It might reflect on the material being studied, the approaches to teaching, **a**nd the assessment of achievement. Above all, the perception of the teachers about the importance of attitude development will be very important. Also Germann (1988) observes that,

> *"The educational process is a social one in which the learners and the teacher come together to share meaning concerning the concepts and skills of the curriculum".*

Moreover, attitudes will develop even if there is no attempt to consider them in a planned way in setting up educational programmes. It makes much more sense to accept this and to build in an awareness among teachers so that opportunities are provided for students to develop attitudes in a more structured and coherent way. The very absence of attention to attitudes may itself encourage the development of an attitude that is unhelpful to the meaningfulness of the whole learning process.

Reid (2003), writing for those who are teaching in higher education in astronomy, chemistry and physics, suggests that there are four broad areas of importance at this and other levels of education.

> *"(1) Attitudes towards the subjects being studied;*
> *(2) Attitudes the actual processes of study and learning;*
> *(3) Social attitudes arising form themes being studied;*
> *(4) Scientific attitudes."*

In general, in looking at attitudes towards the subject being studied, much will depend on the quality of the material being presented, the quality of the teacher(s), the opportunities to apply the material in ways meaningful to the students as well as the nature and relevance (as perceived by the students) of the assessment may be important factors (Skryabina, 2000). Attitudes towards study have been considered in higher education in the work of Perry (1999) and extended considerably by others including the work of Al-shibli (2003) who looked at upper school levels. Attitudes towards themes being studied was considered by Reid (1980) in some detail while the scientific attitude was analysed by Reid and Serumola (2006). They argue it is largely cognitive (a way of thinking) rather than an attitude.

4.13 Attitudes and Achievement

It is very interesting to understand how students' achievement is affected and influenced by their beliefs and attitudes during their educational journey. Schibeci (1984) argued that the student who achieves a good level in any subject because he or she has positive feelings means positive stimulus for further study. This was described as a "*two-way relationship between attitude and achievement*" (Schibeci, 1984).

While it is very apparent that positive attitudes and success are correlated, it is much more difficult to establish which causes the other. Indeed, they might simply influence each other or happen to be present together in many individuals (Christou, 2001). Some have argued (e.g. Schibeci, 1984) that students' feelings and emotions are more central and essential than their achievement. This is because much of what they learn will be forgotten whilst attitudes related to learning are more likely to be longer lasting. However, attitudes are more than just emotions and feelings. Reid (2003) notes that attitudes translate our evaluation of things to certain behaviours toward something or someone. Indeed, they shape our ways of thinking and behaviour and, therefore, assume great importance.

High self-esteem students (those with more positive attitudes towards themselves) are able to limit the effect of any failure because they do not generalise the negative evaluation to all their abilities and life situations. Low self-esteem students cannot compensate for the failure in this way. Thus, it is likely that confidence might not affect future achievement directly but it affects the way a person handles success and failure (Oraif, 2007).

4.14 Conclusions

While attitudes tend to be stable with time, offering to the individual a way by which they can make sense of the world, themselves and their relationships, they are open to change and this is specially true during the years from age 12-20. In looking at the development of attitudes related to education over these years with Libyan students, it is important to remember the powerful societal influences in a culture where family authority is still strong, religious conformity is expected and where the opportunities for girls to be educated and to take their place in the workplace is still relatively new. Teachers are seen as suppliers of information which has to be be recorded and reproduced accurately in examinations. The findings from social psychology research on attitude development, some of which have been discussed in this chapter, must be interpreted in such a context.

Figure 4.8 is shown again, in reduced size, as figure 4.6. This offers a framework for the discussion here.

The teacher is the key influence on the input and it has to be recognised that teachers in Libya will be those who have been successful in a system which rewards accurate recall. Understanding and applying knowledge are not part of their own educational experience.

Teachers will have considerable communicator credibility as the suppliers of knowledge but they will tend to present that knowledge in a didactic lecture-type mode, possibly making argument quality very poor. In that understanding is not valued highly, students may well not understand all they learn but may simply learn how to memorise carefully. All of this will make attitude development in a any structured way highly unlikely.

The work of Festinger (1957) and its development into the concept of 'intra-activity' (Reid, 1981) will probably have no place in what knowledge is presented as 'true' and the requirement is to memorise. The opportunities for dissonance to occur will be rare. This does not mean student attitudes will not develop. It does mean that they are likely to develop simply in terms of developing experiences as they progress through the school and also move through adolescence and into a measure of maturity.

The study being described here has to be interpreted in the light of this general background and context. The questionnaires used and details of the way Libyan education operates is now outlined in general terms before looking at the details of the way data were gathered and analysed.

Chapter Five

Background and Approach

5.1 Introduction

One of the largest problems of attitudes' investigation is in their latent construct nature: attitudes cannot be measured directly, but only deduced from observed behaviour. Probably the easiest way is to know a person's attitude is simply ask the person and this is the most common approach in educational research.

This chapter outlines how the research was carried out in general terms. It discusses the methods and techniques that were employed to gather and analyse the data, and also seeks to give an outline of the Libyan education system. The study was set against a background of problems which exist in Libya and these are outlined first.

5.2 The Situation in Libyan Schools

The main problem at present of education in Libya is the quality of education The need to build so much in order to educate so many in a short time creates the classical dilemma of quality of education versus quantity education. In fact, this problem is not the problem of Libyan education only but is a problem common to many developing countries.

There is also a shortage of Libyan school teachers at secondary school level especially those qualified in science subjects. This leads to a problem with Libyan students especially in the science subjects. This problem has existed from 1988 (Turki, 1994). Overall, the curriculum of the high schools (ages 16-20) is not connected to the students' environment or lifestyles while the curriculum presents concepts in very abstract ways. There is frequently not enough equipment and facilities at some schools (e.g. computers and laboratories). Classes are often large with an inadequate supply of teachers. Finally, the examination system emphasises the rote recall of information and holds great power over the learners at key times of the year.

Against this background, students are often not very satisfied or fulfilled in their studies and often show this by leaving school or simply failing to attend.

5.3 Field of the Research

The aim of the present research was to explore student attitudes to all aspects of their educational journey at various stages and ages. Students in middle schools (ages 12-15) and high schools (ages 16-20) were involved, the aim being to see how attitudes moved with time, trying to pin-point the key aspects of the educational system which were causing most problems and which were viewed most positively. The aim was to gain a picture of what was happening and to find out students views about their learning experiences. This included attitudes towards:

The curriculum in general;
Specific studies at middle and high school levels;
Subjects chosen at later stages;
Teachers and teaching approaches;
Practical work, where appropriate;
The organisation of the curriculum;
and
How pupils saw themselves in relation to their studies in Arabic, English, Mathematics and the Sciences.

A number of other aspects were also explored:

How the students see things at school in relation to future careers;
Areas of student interest;
Reasons for studying Science, Arts, or Technology;
Students' career aspirations;
Perceptions of being at high school;
Preferred activities in subject lessons.

Much data was collected using questionnaires, with large samples of students at various ages. However, interviews were also conducted to seek to confirm the evidence from the questionnaires and to offer more detailed insights.

There are some established guidelines for questionnaires (e.g. Reid, 2003). Denscombe (1998) proposed the development of a list of written questions, selecting such questions which closely relate to the aims of the study. It is useful to consult experts (those familiar with the situation) to offer advice on the final question selection. It is important that ambiguities are avoided and that the students who read the questions gain the meaning intended by the designer. This allows for consistency and precision in terms of wording of the questions, and makes processing of the answers easier. This consistency and precision will encourage reliability and validity in the questionnaire.

Reid (2003, p. 41) offers a set of guidelines:

"(a) Write down as precisely as possible what you are trying to find out;
(b) Decide what types of questions would be helpful;
(c) Be creative and write down as many ideas for questions as you can,
(d) Select what seem the most appropriate from your list-keep more than you need;
(e) Keep the English simple and straightforward, avoid double negatives, keep negatives to a reasonable number, look for ambiguities, watch for double questions;
(f) Find a critical friend to comment on your suggested questions;
(g) Pick the best, most appropriate and relevant questions, thinking of time available;
(h) Layout is everything!!
(i) Try your questionnaire out an a small sample of students (e.g.. a tutorial group) ask for comments, criticisms. Check time required.
(j) Make modifications and only then apply to larger group;
(k) Analyse each question on its own".

He summarised these in simple diagram (Figure 5.1)

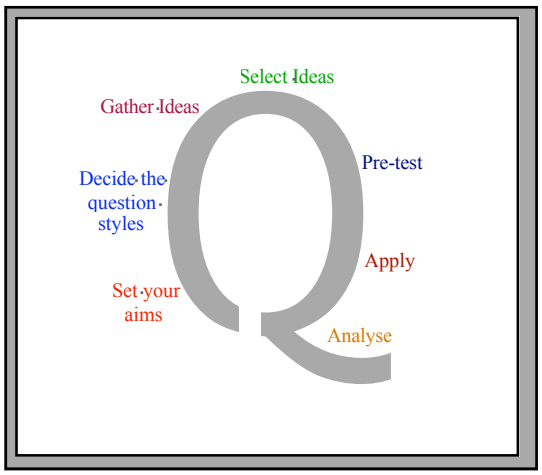


Figure 5.1 Questionnaire Construction (Reid, 2003, p. 41)

Oppenheim (1992) stresses that questionnaires designed to measure attitude should be able to reproduce the results after a certain period of time (reliability) and that there should be evidence that they measure what they claim to measure (validity). Ravid (2000) argued that there is much in the literature about reliability but most describe measures of internal consistency, using correlation techniques. However, if the questions are designed to measure numerous different features, then internal consistency is not necessarily important and traditional methods are inappropriate. If questions are are designed carefully, the questionnaire being of a reasonable length and care taken in its use, then reliability will not be a major issue (see Reid, 2003). It is also possible to have themes explored in several ways to relate the responses to the various questions. Issues relating to validity and reliability will be discussed in more detail later with respect to the actual questions used and the way they were constructed.

5.4 Method of Collecting Data

Middle Schools in Libya run from about age 12 to age 15 while High Schools follow up to age 18, with some students staying on to age 20. The aim in this study is to look at students from age 12 to age 20, the years of Middle and High School. The samples were drawn in such a way that they reflected the social mix of the country and different types of schools. This is not easy in that boys and girls are educated separately and there are separate schools for different specialisms at High school level. To gain an accurate and reliable picture of student views, large samples were taken as far as possible. There was also a focus on specific age groups reflecting the key stages in the students' educational journey: the final year of middle school when course choices are made, the final stages of High school when students are able to look back and reflect on their educational experiences.

The interviews focussed on some teachers as well as students. The overall aim was to seek to find out the attitudes of students but there was an opportunity to talk to some teachers to see to what extent their views mirrored the views of their students.

The number of students involved in the present research is summarised in table 5.1 and 5.2, illustrating the size of the samples involved. This allowed for the comparison of responses between subgroups to look for trends, patterns and differences.

Academic Year	Students
2003-2004	859
2004-2005	343
2005-2006	737
Total	**1939**

Table 5.1 Numbers Involved

Survey	Boy	Girl	Total
First	458	401	859
Second	78	265	343
Third	284	453	737
Total	**820**	**1119**	**1939**

Table 5.2 Boys and Girls Involved

5.5 Historical Background of Libya

Libya's population of approximately 6.5 million lives mainly in the North of the country, the fourth largest country on the Africa continent. It has a Mediterranean sea coast line of about 1900 kilometres. Libya is a large country with an area of about 1.8 million square kilometres, seven times the size of the United Kingdom (Almansory, 1995, pp. 5-30).

Figure 5.2 Map of Libya

There was more or less no unified organisational activity in Libya before the period of independence (Agnaia, 1996). The main reason for that was because Libya was subjected to many foreign occupations: the Ottoman Empire's long occupation (1551-1911); the Italians invaded Libyan territory in 1911; in 1912, the Turkish signed the "Ouchy" treaty with Italy. leaving the Libyan people to face a harsh colonial destiny. They resisted the invading force for more than twenty years (D. F. i, 1991).

At the end of 1943, the British entered Libya and established a military government in the country. The French entered the southern region of Libya and established their military rule. From 1942 to 1951, Libya was under temporary British military rule but, in 1951, the independence of the country was acknowledged through the United Nations. The Libya government was established as a Kingdom.

5.6 Education Background

The quality of education depends on the situation in a country, and developing countries differ from developed countries in their educational provision. Today, there is major investment in education in the view that education is very important in people's lives and their children's good future careers.

The situation in schools in Libya is that of a developing country. Clearly there are problems about the quality of education. The need to build so much in order to educate so many in a short time brings its own problems. The Libyan government fully supports and finances the education system at all levels (free education for all stages).

On independence in 1951, a UNESCO Commission came to Libya to report and to make recommendations about education. They reported that there were only 29 primary school in the capital city of Libya (Tripoli) and only one in the other major city (Zawia). There was one teacher training centre for women in Tripoli (Toruneav, 1952). The primary school system in Tripoli was based on the Egyptian syllabus, and the upper primary school system followed the Italian school curriculum. Education was given no priority at all under these periods of occupation.

During the period of monarchy, all Libyans were guaranteed the right to education at school at all levels but education was not compulsory (Yousif, *et al.,* 1996). In September 1969, there was a major revolution which altered things quite dramatically. This revolution made many positive steps in Libya and education started to grow at an enormous rate, alongside huge economical, political, and social changes in the country (see table 5.3).

Growth in Education in Libya		
Year	**Number**	**Literacy**
1951	34000	population literacy < 20%
1962	150000	female literacy ~6%
1969	360000	
1977	980000	overall literacy 51% but females 31%
1986	1245000	literacy: 54% male, 46% female
2004	1477000	literacy: 92% male, 72% female

Table 5.3 Growth in Education

Under the Constitution of 1969 (amended 2 March 1977), Libyans are guaranteed the right to education. Primary and high schools were established all over the country, and old Quranic schools that had been closed during the struggle of independence were reactivated

and new ones established, lending a heavy religious perspective to Libyan education. The educational program suffered from a limited curriculum, a lack of qualified teachers and a marked tendency to learn by rote rather than by reasoning. Libya's population of approximately 6.5 million now includes 1.7 million students (Khalifa, 2000). Education in Libya expanded particularly rapidly between 1973 and 1984 (Yousif *et al.,*1996). During this period, the size of the school population doubled, girls in the student population increasing by 130 percent, compared with 80 percent for boys.

5.7 Structure of Education System in Libya

Formal education in Libya is organised from age four and general education in Libya involves thirteen years with pupils entering primary at the age of six (see table 5.4).

Stage	Year Group	Ages	Period
Primary	1-6	6-12	6 years
Middle	7-9	12-15	3 years
High	10-13	15-19	4 years

Table 5.4 Three Levels of School Education

The overall structure of the education system can be seen in figure 5.3. The focus of this study is on Middle and Higher Schools (age 12-18+)

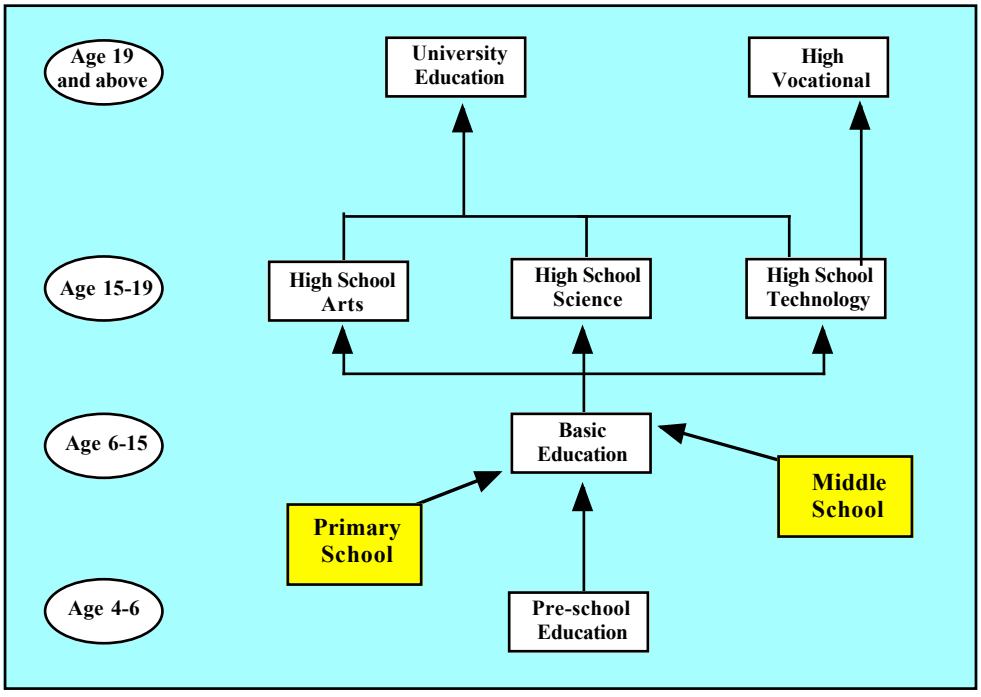


Figure 5.3 Structure of Education in Libya

The vast majority of children in Libya (99%) attended state schools for the compulsory education stages, involving primary and middle school. Very recently, the compulsory stage has been extended to the end of High School. There are examinations at the end of each year and students who pass may proceed to the next year of study. Performance in examinations at High school determines entry to university or college.

5.8 Curriculum Aims of the Schools

In Libya, the government provides policy statements detailing the aims of the school. The curriculum must cover all the activities in a school designed to promote the moral, cultural, intellectual and physical development of students, and must prepare them for the opportunities, responsibilities and experiences of life and society. The following is an extract from the curriculum policy statement aims prepared by the Libyan Education Authority (1995), translated into English:

(a) Build knowledge and skills which enable children to understand a wide range of concepts and apply this understanding in appropriate ways;
(c) Ensure that appropriate provision is made for all children to achieve their full potential;
(c) Develop positive attitudes to learning in an environment which will preserve self-esteem and Confidence
(d) Develop as wide a variety as possible all curriculum skills and knowledge necessary for everyday life;
(e) Develop a positive attitude to physical activity through participation in activities which promote confidence and self-esteem;
(f) Work in partnership with parents and the community enabling children to gain maximum benefit in their environment.

However, while educational improvement is still a priority for the government, the educational programmes suffer from limited curricula, a lack of qualified teachers (specially Libyan teachers), and a strong tendency to learn by rote rather than by reasoning, a characteristic of Arab education in general. Nonetheless, education is already free at all levels, and students receive a substantial stipend.

5.9 Compulsory Education

This stage of education is compulsory for the pupils to get a certificate allowing them to enter high school. This stage includes 9 years of education, from 6 and 15 years old usually, with two levels: primary and middle. The primary school starts from the age of 6 years until 12 years after which the pupils move to the middle level where they have 3 years of study to finish the compulsory school. This level is ended by a national examination which is considered by the pupils as a new and frightening experience.

This examination is organised at the level of the county and all pupils of the same county are examined simultaneously. What makes the experience for pupils more challenging is that other teachers correct their work. It is rarely that the rate of the success attains 60%. This national exam is considered as an obstacle diminishing the rate of the success. This method of examination has a psychological impact on the pupils. For this reason, the final year of compulsory school is chosen for the questionnaire since the pupils have already developed on opinion about the examination system and its impact on learning and studying: aim of this research .

The curricula, in terms of subjects to be studied is shown in table 5.5.

Curriculum in Libyan Schools				
Schools	**Primary**	**School**	**Middle School**	**High School**
Grades	**1st-3th**	**4th--6th**	**7th-9th**	**10th-13th**
	Arabic	Arabic	Arabic	Arabic
	Mathematics	Mathematics	Mathematics	Computing
	Religion	Religion	Religion	Religion
	Physical Ed	Physical Ed	Physical Ed	Physical Ed
	Painting	Painting	Painting	English
		Culture	Culture	Culture
		Science	English	
		History	Biology	*plus*
		Geography	Chemistry	*choice by*
			Physics	*subject*
			History	*direction*
			Geography	

Table 5.5 The Curriculum (Schools in Libya)

5.10 The High School

After the success in the national examination, the students may move to the high school where they finish their study. There are many types: general high schools (Science, Technology and Arts sections), specialised high school and intermediate vocational centres. In 1996-97, it was decided to create specialised high schools in Basic Sciences, Economics, Biology, Arts and Media, Social Sciences and Engineering. Studies usually last for four years (three years in general high school and vocational training schools, and five years in Teacher Training institutions) (IAU, 2000).

This study will focus on the three main types of high school (science, technology and arts). To pass the examinations, students must have success every year during the four years. The fourth year is ended by a national examination organised at the level of the whole country. The period of high school is a decisive phase in the student's career. It also includes the later stages of adolescence which can affect greatly the student's attitude. This research seeks to explore the factors that determine the student's attitude towards studying and learning in general and specifically in the sciences, English, Arabic language, and mathematics).

5.11 Higher Education

Higher education is offered in universities and higher vocational institutes (El-Hawat, 2003). Admission to both programmes requires the High Education Certificate awarded at the the end of the high school. Since 1990, all universities require a score of 65% or better in this national examination. Some faculties (such medicine and engineering), require scores exceeding 75% for admission, Students who have an average below 65% are admitted to higher training and vocational institutes. Students from specialised high school are strongly encouraged to continue their field of specialism at the tertiary level (for example (medicine, engineering, economics).

Consistent with other countries, degrees are awarded at bachelors, masters and doctorate levels. Libyan universities contains three major disciplines: Arts, Science, Technology and Medicine. Graduation in Faculty of Arts is after four years, in science after five years and in medicine after five to seven years (El-Hawat, 2003). Hence, the university sector has been transformed from a single, state-run multipurpose university into a decentralised group of generalist and specialised universities. In addition, there appears to be an

imbalance between the number of students enrolled in the humanities and arts, and those in sciences and technology.

5.12 Conclusions

Libyan education from age 12 has three years in Middle Schools and 3 (recently extended to 4) years at High School. The whole system evolved from Italian and Egyptian influences after 1945 specifically in the middle school, and the growth is enormous, bringing about considerable strain in the system. The signs of stress are shown by students opting out at later stages, problems of teacher supply in certain subject areas, a very marked curriculum bias reflecting the job market, heavily overloaded curricula, frequently abstract and difficult in the sciences and mathematics.

The aim of this study is to explore in some detail what is going on in terms of how the students see their educational journey as well as some limited teacher perspectives so that the key areas where there are problems can be identified. Very often, educational provision is studied by looking at what is offered and the way it is offered. This study aims to look in some detail at the attitudes and perspectives of the learners from various stages from age 12 to 20. The question is how they see their experiences and what changes they would like to make.

Chapter Six

The First Survey

6.1 Introduction

The situation in schools in Libya has been outlined in chapter five. Clearly there are problems and this study seeks to explore student attitudes towards learning in schools, particularly during the teenage years. This can be done by applying a questionnaire to various year groups at the same time in the year. With large samples, this offers a series of pictures of student attitudes at several stages in their educational journey.

In applying this questionnaire, student perceptions of themselves in their study were the main area of focus. Their attitudes towards many aspects of school life and to specific subject areas were also explored. The intention was to gain an overview on the present situation and to see how attitudes developed with age. This would provide an agenda for further enquiry.

A large number of questions was developed and these were considered critically by a number of researchers. In the light of the comments received, the list of questions was reduced to 64 and this list aimed to cover a wide variety of aspects of school life, family circumstances, social contexts and aspirations for the future. The questions were then translated into Arabic and the translation checked.

The problem with all questionnaires is uncertainty over validity. Are the students responding to the questions to give an accurate picture of their attitudes. If students feel that their responses can influence their future prospects at school, then they may respond to give what they see as desirable impressions. Equally, it is possible for students to respond giving answers which reflect how they would *like* things to be rather than what they really are.

By subjecting the questionnaire to careful scrutiny by other researchers, it was hoped that obvious ambiguities and lack of clarity would be removed. It was also hoped that the questionnaire would have reasonable face validity. In other words, the aim was to check if the questions are likely to reflect the issues under consideration.

It is difficult to be certain about validity but the questionnaire did not seek to obtain any absolute picture about the attitudes of the school students. Indeed, Reid (2006) has stressed that attitudes cannot be measured in any absolute sense. All that can be done is

to *compare* attitudes measured in one situation with those in another. In this case, the attitudes of the students at various stages in their school journey were compared to see if any obvious trends were apparent.

Another important issue is the question of reliability. Will the questionnaire give similar results under similar conditions? It is been pointed out that questionnaires tend to be reliable when samples are large and when the questionnaire is applied with care (Reid, 2003). The students were told clearly that their responses would not affect their academic a career in any way. They were encouraged to respond honestly and were given adequate time to complete the questionnaire. The questionnaires were also anonymous. By taking these steps it is likely that reliability would be assured (Reid, 2003).

The aim of this questionnaire is simply to gain an overview of the key issues in order the be able to define the next stages of the enquiry. The questions are interpreted with this in mind and only the more obvious trends and patterns of results are considered.

6.2 Organisation

The questionnaires were distributed to large groups of students aged from 12 to about 20. Five age groups were involved and the samples are shown in table 6.1. The gender balance varies considerably from year group to year group as access to students was sometimes difficult.

Age	N
12	225
15	232
17	143
18	182
20	77

Table 6.1 Sample sizes

Age	Boy	Girl	Total
12	91	134	225
15	178	54	232
17	93	50	143
18	61	121	182
20	35	42	77
Totals	**458**	**401**	**859**
Percentage	**53%**	**47%**	**100%**

Table 6.2 Students Involved from Five Age Groups, by Gender

The students were drawn from a wide range of schools reflecting urban and rural catchment areas. The samples were chosen to be typical of the population of students at these ages in Libya. Girls and Boys are educated separately and gaining access to equal numbers of schools proved difficult, making the gender balance uneven.

The choice of the age groups was important. Age 12 is the first year of middle school under the Libyan system while age 15 is the uppermost year in middle schools. By comparing responses with these two age groups, attitude development through the middle school could be checked. The other three groups are drawn from various stages on the high school. Students can stay on at school for a longer time than as common in Western countries: however, the sample of students aged 20 was very small. The existence of this sample needs some explanation. The procedure in Libya is that students repeat a year if they fail to achieve the required level of performance. In addition, a small number of students leave for various reasons and some of them return later to complete their education.

6.3 Questionnaire

To give an overall view of the questionnaire, it is shown in full. The actual layout as used with the students is shown in the appendix. The questionnaire was presented to the students without any side headings. The side headings are shown here simply for clarity,

Section 1 **Personal information about the students.**

(1) Are you ☐ boy ☐ girl Your age: ……..

(2) Which school do you attend? ……

(3) How do you travel to school? ……

(4) How many brothers and sisters do you have? brothers: ☐ sisters: ☐

(5) How many of your brothers and sisters are ***older*** than you? ……

(6) How many students usually are in your class: ☐ Less than 20 ☐ 20-25 ☐ 25-30
☐ 30-35 ☐ 35-40 ☐ More than 40

(7) What is your parents' level of education?

	compulsory	high	university
mother	….	….	….
father	….	….	….

(8) Directions of study you have already chosen or are considering: ☐ Arts ☐ Sciences
☐ Technological study

(9) Would you like to have good qualifications? ☐ yes ☐ no

(10) Where would you like to see yourself in the nearest future? (*Tick as many as you wish*)

☐ leaving school as soon as possible to take a job ☐ training to be a doctor, nurse, or health worker
☐ having a family ☐ going to university ☐ training to be a teacher
☐ working as an engineer ☐ being involved in sport ☐ working in art, music or drama
☐ travelling widely ☐ others, please state …….....……

(11) What do you like to do in your free time? .....

(12) List your favourite ***three*** school subjects ***in order***: (1) ……..
(2) ……..
(3) ……..

(13) What is *least* favourite school subject? ……..……

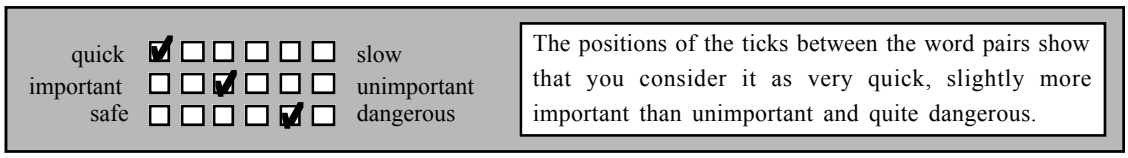
Section 2 Aspects of school life

(14) How much do you agree?

Tick one box in each line to show how far you agree with each statement from strongly agree to strongly disagree.

I enjoy using new technology like computers in my learning	☐	☐	☐	☐	☐
I do *not* believe in just accepting what the teacher says without question. Success involves thinking for myself	☐	☐	☐	☐	☐
I like exams which give me an opportunity to show I have ideas of my own	☐	☐	☐	☐	☐
I prefer to learn the facts and then be tested on them in short questions	☐	☐	☐	☐	☐
My school is well equipped to help me learn well	☐	☐	☐	☐	☐
There are too many pupils in my class	☐	☐	☐	☐	☐
In order to pass my courses, I need to study just what the teacher tells me	☐	☐	☐	☐	☐
My school does *not* have enough computers	☐	☐	☐	☐	☐
We cannot call anything scientific knowledge if it is not absolutely true.	☐	☐	☐	☐	☐
I believe it is the job of the teacher to supply me with all the knowledge	☐	☐	☐	☐	☐
All one has to do in science is to memorise things	☐	☐	☐	☐	☐
My school is preparing me well for what I shall do later in life	☐	☐	☐	☐	☐
In exams, I like questions that give me the scope to go beyond what is taught and show my ability to think	☐	☐	☐	☐	☐

Here is a way to show what you think of a racing car



Use the same method of ticking to how your opinions in the following questions

Section 3 Subject and Approaches Study

(15) What are your opinions about your ***studies in science subjects***?
Tick ONE box on each line.

Not helpful	☐☐☐☐☐☐	Helpful
Easy to understand	☐☐☐☐☐☐	Not easy to understand
Boring	☐☐☐☐☐☐	Interesting
Well organised	☐☐☐☐☐☐	Not well organised
The best part of school	☐☐☐☐☐☐	The worst part of school
Not enjoyable	☐☐☐☐☐☐	Enjoyable

(16) What are your opinions about your ***studies in Arabic language***?
Tick ONE box on each line.

Not helpful	☐☐☐☐☐☐	Helpful
Easy to understand	☐☐☐☐☐☐	Not easy to understand
Boring	☐☐☐☐☐☐	Interesting
Well organised	☐☐☐☐☐☐	Not well organised
The best part of school	☐☐☐☐☐☐	The worst part of school
Not enjoyable	☐☐☐☐☐☐	Enjoyable

(17) What are your opinions about your ***studies in Mathematics***?
Tick ONE box on each line.

Not helpful	☐☐☐☐☐☐	Helpful
Easy to understand	☐☐☐☐☐☐	Not easy to understand
Boring	☐☐☐☐☐☐	Interesting
Well organised	☐☐☐☐☐☐	Not well organised
The best part of school	☐☐☐☐☐☐	The worst part of school
Not enjoyable	☐☐☐☐☐☐	Enjoyable

(18) What are your opinions about ***learning in school***?
Tick ONE box on each line.

I feel I am coping well	☐☐☐☐☐☐	I feel I am not coping well
I am not enjoying school	☐☐☐☐☐☐	I am enjoying school
I have found school work easy	☐☐☐☐☐☐	I found school work hard
My school results are getting worse	☐☐☐☐☐☐	My school results are getting better
School is benefitting me	☐☐☐☐☐☐	I am wasting my time at school
Work at school is relevant to my needs	☐☐☐☐☐☐	Work at school is irrelevant to my needs
My parents are interested in my education	☐☐☐☐☐☐	My parents are not interested in my education

(19) What are your opinions about ***learning approaches in school***?
Tick ONE box on each line.

I find my textbooks helpful	☐☐☐☐☐☐	I find my textbooks unhelpful
Examinations do not help me to learn	☐☐☐☐☐☐	Examinations help me to learn
I enjoy practical work at school	☐☐☐☐☐☐	I do not enjoy practical work at school
I like the way my school is run	☐☐☐☐☐☐	I do not like the way my school is run
School tells me what I have to memorise	☐☐☐☐☐☐	School encourages me to think for myself
Most subjects at school are useful	☐☐☐☐☐☐	Most subjects at school are not useful
I prefer working on my own	☐☐☐☐☐☐	I prefer working in a group

6.4 Data Analysis

The data obtained from all five age groups are shown together, question by question. Comparisons are made between response patterns for the different age groups using chi-square as a contingency test. In this, there is no control group. Chi-square is a non parametric statistic which is used to compare two sets of frequency data. It can be used in two ways depending on whether there is a control group or not. Care must be taken in its use in that misleading results can be obtained when any category falls too low. To avoid this happening, a minimum category limit of 5%, or ten students (whichever was more critical), was applied. Data grouping was used when this was observed. The use of chi-square is discussed in the appendix**.**

The early questions largely involve factual data and these are discussed first. Each of the following questions is then discussed in some detail.

Walking tends to be more common with the younger age groups while the use of cars and buses is more common with the older groups. This is because middle schools tend to be nearer homes but high schools are further away.

In table 6.4, each box shows two numbers, the first indicating the *percentage* of the group with the number of brothers in the one column and the second being the percentage of the group with the number of sisters. The table shows the clear trend of smaller family sizes in a very short period.

Question 4/5 How many brothers and sisters do you have							**All as %**	
	Brother and sister		**Brother and sister**		**Brother and sister**		**more than 5**	
Age	**0**	**1**	**2**	**3**	**4**	**5**	**Brother**	**Sister**
12	8+8	19+20	28+27	18+20	10+13	7+5	10	7
15	4+3	15+19	19+19	18+25	22+12	9+8	12	14
17	1+1	12+10	16+24	21+25	24+10	15+12	11	18
18	0+0	5+8	13+13	23+20	15+17	17+13	27	29
20	0+0	3+3	12+10	13+16	16+12	14+14	42	45

Table 6.4 Question 4 and 5

The outcomes of this question relate with question 7 (parents level of education), giving a picture in Libyan family society which may be having an effect on students education. Family size is clearly dropping rapidly and this often happens as education provision (especially for girls) grows **(**Knodel et al, 1990, p. 31; King,, 1987).

Question 6

Question 6 How many students in your class					
	Age				
	12	**15**	**17**	**18**	**20**
Less-20	8	12	5	6	4
20-25	12	12	8	8	22
25-30	62	20	22	35	20
30-35	13	39	29	34	36
35-40	5	6	24	14	17
more-40	0	11	12	3	1
'Average'	**27.2**	**29.9**	**32.2**	**30.1**	**29.6**

Table 6.5 Question 6

The pattern of responses to question 6 are shown in table 6.5. The 'average' class size was found simply by the midpoint of each range and creating a weighted average. This reveals a real problem when compared to schools in many Western countries: class sizes are large at all levels. Part of the reason in Libya is simply the teacher shortage.

Subedi (2000, 2003) investigated the effect of resources and classes size on student achievement and he noted that the average student's classroom achievement, to some extent, may depend on the teacher's specific way of instruction and that there is a substantial effect of class size on students' scores.

Question 7

Question 7 Parents Level of Education								
	None		Compulsory only		High School		University	
Age	*Father*	*Mother*	*Father*	*Mother*	*Father*	*Mother*	*Father*	*Mother*
12	6	20	16	35	29	23	49	22
15	13	28	21	31	17	24	49	17
17	8	35	29	33	19	19	44	13
18	20	58	35	25	20	9	25	8
20	30	75	30	21	26	3	14	1

Table 6.6 Question 7

Several trends are very apparent in the data shown in table 6.6. Some of the data for age 12 and age 18 and 20 are coloured to illustrate the very marked changes. Firstly, there has clearly been a remarkable change over a very few years in parental education. While the education levels of parents of students aged 20 tend to be low, the education levels of parents of students age 12 are very much higher. The difference is quite remarkable over an 8 year period, showing the enormous growth in education many years ago when these parents might have been at school and university.

The other observation is the change in the way girls and women are educated. Thus, while 75% of the mothers of 20 year olds had no education, this has now dropped to 20%.

Indeed, mothers of 12 year olds have taken advantage of university education, the percentage having risen to 22% for age 12 students. However, there are still fewer women with university education than men. This change means that large numbers of women are being released into the workplace with good qualifications. This has immediate implications for employment opportunities, for the upbringing of children, perhaps for family sizes, and for the social roles of men and women in Libya.

Questions 8 and 9 refer to "Direction of Study". Boys and girls are not only taught separately but they also attend different schools at high school stages depending on whether they have opted for courses based on arts, sciences or technology (directions of study).

Questions 8 and 9

Questions 8 and 9					
	Direction of Study			Good Qualifications	
Age	*Arts*	*Sciences*	*Technology*	*Yes*	*No*
12	13	46	41	100	0
15	13	69	18	98	2
17	14	45	41	97	3
18	13	45	42	100	0
20	67	13	20	99	1

Table 6.7 Questions 8 and 9

While almost all want good qualifications, it is interesting to note that the sciences and technology specialisations tend to attract the vast majority of students at all ages (except age 20), indicating the way these areas are perceived by students at all ages. The odd results for age 20 may be explained by the fact that this group contains a proportion of those who repeated years earlier on in their career and those who left school to return later.

Question 10

Question 10 Where would like to see yourself in the future					
	Age				
	12	**15**	**17**	**18**	**20**
Leave school/to take a job	0	0	0	0	0
Doctor	37	39	29	9	1
Having family	1	3	3	5	10
Going to university	15	24	32	47	56
Teacher	5	2	8	14	8
Engineer	18	14	13	3	4
Medical (nurse, health work)	7	2	1	2	0
Culture (art, music, drama)	0	1	1	2	0
Employee	3	2	7	8	5
Sports	4	5	2	1	7
Travelling	8	7	4	9	9
Others	1	1	0	0	0

Table 6.8 Question 10

While being a doctor, engineer or going to university all show high numbers at all ages, the trends are important, the first two being much less attractive with age while 'going to university' becomes more attractive with age. This is probably because the younger students do not appreciate that going to university is essential for careers like medicine and engineering.

Question 11

Question 11 What do you like to do in your free time					
	Age				
	12	**15**	**17**	**18**	**20**
Reading	29	31	32	40	34
Studying	18	9	8	13	8
Sports	11	31	19	12	14
Playing	14	8	2	1	3
Working	2	7	5	7	8
Watching TV	2	2	8	7	9
H. family	2	1	5	3	3
Shopping	0	1	0	1	0
Listening to music	7	3	4	10	8
etc.	6	5	13	2	6
Travelling	0	0	1	0	0
Others	9	2	3	4	7

Table 6.9 Question 11

Student preferences are spread widely and there are few strong clear trends with age.

Question 12

Question 12 List your favourite school subjects in order					
	Age				
	12	**15**	**17**	**18**	**20**
Science*	12				
Biology	3	28	15	5	4
Chemistry	9	13	13	1	0
Physics	1	3	3	1	1
Mathematics	31	15	11	13	4
English language	13	10	8	8	7
Arabic language	10	11	5	10	12
History	1	3	3	7	4
Geography	1	0	1	2	4
Religious Education	10	7	20	23	30
Koran			1	4	13
Psychology			3	12	8
Philosophy	0	3	2	4	2
Computing	3	6	8	9	9
Art	3	2	1	0	0
Other	3	0	5	1	2

Table 6.10 Question 12

Table 6.10 reflects two possible factors: there are changing preferences with age; there may also be preferences changing as education and society change very rapidly. If age is the dominant effect, then some patterns are interesting. The very high popularity of biology/science at age 15; the fall off in popularity of mathematics; the slow decline in popularity of English with age; the reasonable popularity of Arabic at all ages; the sudden rise in the popularity of religious education at older ages.

Religious education and Arabic are both compulsory for all ages at school while mathematics is compulsory at primary and middle school. This partly explains their high ratings. English language is taken by all students at all Libyan schools from year seven (in first year in middle school) until they leave school. (Libyan National Commission for Education, 2001). Teacher shortages also can affect subject popularity. Where these occur, the Middle schools tend to suffer.

Question 13

Question 13 Least favourite school subject					
	Age				
	12	**15**	**17**	**18**	**20**
Science/ Biology	2	1	4	5	7
Chemistry	11	7	2	6	4
Physics	38	22	13	10	3
Mathematics	6	12	3	12	17
English language	7	22	11	29	36
Arabic language	5	8	8	9	7
History	10	5	7	6	9
Geography	9	11	7	6	1
Religion Education	4	3	7	2	3
Psychology	0	0	5	0	1
Philosophy	0	6	3	0	1
information	4	1	3	4	4
not specify	4	3	27	11	7

Table 6.11 Question 13

Again, table 6.11 again reflects two possible factors: changing preferences with age; preferences changing as education and society change very rapidly. If age is the dominant effect, then some patterns are interesting. the decreasing unpopularity with physics (maybe due to students opting out of it); the increasing unpopularity in mathematics; the very large unpopularity of English; the general even scattering otherwise.

Looking at tables 6.10 and 6.11 together, mathematics is clearly very popular with some and very unpopular with others. While general science and biology are popular, physics is highly unpopular. Previous work showed the unattractiveness of a content-heavy syllabus in physics in Libya, with many abstract ideas often presented in ways unrelated to life (Hamed, 2005). English language is popular with some but there are very large numbers for whom it is unpopular, this increasing with age. All the evidence shows that second language acquisition should be started as early as possible in life and the data here fits this pattern. Interestingly, religious education is popular, this growing with age. This may reflect the almost monolithic nature of Islam in Libya and the strong cultural norms which run through the whole society.

Question 14

I enjoy using new technology like computers in my learning	☐ ☐ ☐ ☐ ☐
I do *not* believe in just accepting what the teacher says without question. Success involves thinking for myself	☐ ☐ ☐ ☐ ☐
I like exams which give me an opportunity to show I have ideas of my own	☐ ☐ ☐ ☐ ☐
I prefer to learn the facts and then be tested on them in short questions	☐ ☐ ☐ ☐ ☐
My school is well equipped to help me learn well	☐ ☐ ☐ ☐ ☐
There are too many pupils in my class	☐ ☐ ☐ ☐ ☐
In order to pass my courses, I need to study just what the teacher tells me	☐ ☐ ☐ ☐ ☐
My school does *not* have enough computers	☐ ☐ ☐ ☐ ☐
We cannot call anything scientific knowledge if it is not absolutely true.	☐ ☐ ☐ ☐ ☐
I believe it is the job of the teacher to supply me with all the knowledge	☐ ☐ ☐ ☐ ☐
All one has to do in science is to memorise things	☐ ☐ ☐ ☐ ☐
My school is preparing me well for what I shall do later in life	☐ ☐ ☐ ☐ ☐
In exams, I like questions that give me the scope to go beyond what is taught and show my ability to think	☐ ☐ ☐ ☐ ☐

I enjoy using new technology like computers in my learning

Age	SA	A	N	D	SD	Compare	χ^2	df	sig
12	76	10	6	3	5				
15	70	17	6	3	4	15 and 12	5.0	3	n.s.
17	78	13	6	1	1	17 and 15	3.1	2	n.s.
18	71	12	8	2	6	18 and 17	4.7	2	n.s.
20	66	13	5	7	9	20 and 18	0.7	2	n.s

Table 6.12 Question 14 (a)

The majority in every year group show a positive response to the use of new technology in their learning. No clear trend with age is apparent. Computers do seem to be attractive for learners but the questions remains as to whether they *improve* learning at all.

I do not believe in just accepting what the teacher says without question.

Age	SA	A	N	D	SD	Compare	χ^2	df	sig
12	68	16	6	4	6				
15	41	32	12	5	10	15 and 12	35.3	3	0.001
17	14	79	5	1	1	17 and 15	77.4	2	0.001
18	55	27	11	3	4	18 and 17	87.5	2	0.001
20	66	13	12	4	5	20 and 18	6.0	2	n.s

Table 6.13 Question 14 (b)

This question reveals a very strange pattern, with those aged 17 seeming to hold very different views. There is a drop in the 'strongly agree' responses with age 17 and an increase in the 'agree' responses. Age 17 is the first year of high school for many of the students and this may be the source of the explanation. Nonetheless, the vast majority in all age groups say that they do not believe in just accepting what the teacher says. This is surprising in an educational setting where the rote recall of information provided by means of lecture type teaching brings the rewards in examinations. Is it an expression of wanting something better?

I like exams which give me an opportunity to show I have ideas of my own									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	69	18	5	4	4				
15	63	20	10	3	3	15 and 12	4.7	3	0.05
17	55	30	9	4	3	17 and 15	4.3	3	n.s.
18	67	23	6	3	2	18 and 17	4.7	3	n.s.
20	58	27	4	8	3	20 and 18	1.5	2	n.s

Table 6.14 Question 14 (c)

In general, all groups agree with the statement and differences between the groups tend to be small, largely caused by movements between the first two categories. The responses suggest a desire from many students in Libya for opportunities to show their own ideas in a system which more or less only rewards recall of prescribed information: "the examination system emphasises the rote recall of information and holds great power over the learners at key times of the year" (Khalifa, 2000, p. 15). In a recent study in Saudi Arabia (Oraif, 2007), the same question was asked and first year university students were also keen to have examinations which showed they had ideas of their own. Along with other evidence in the Saudi study, students were shown to be frustrated with examinations which just tested recall. Perhaps the same is true here.

I prefer to learn the facts and then be tested on them in short questions									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	62	17	8	4	9				
15	55	23	10	8	5	15 and 12	6.9	3	n.s
17	47	28	13	6	6	17 and 15	5.2	3	n.s
18	62	24	4	4	6	18 and 17	20.8	3	0.001
20	60	18	8	5	9	20 and 18	3.7	3	n.s

Table 6.15 Question 14 (d)

Few significant differences are found with all groups tending to agree with the statement although the group aged 17 are not quite so positive. The results from this question seem to contradict the responses from question 14(c). The students want the freedom to express their own ideas but they still want short question which test facts!

Questions (b), (c), and (d) offer a fascinating if confusing picture. The students say that they tend not to believe in just accepting what the teacher says, they want examinations which give an opportunity to express their own ideas but, at the same time, prefer to learn facts and be tested on them in short questions. If the responses are a valid representation of views, this might offer a picture of students who want to be free to think for themselves but fear the consequences in examinations which so dominate the education system.

My school is well equipped to help me learn well									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	36	12	14	7	32				
15	22	16	20	11	31	15 and 12	12.7	4	0.05
17	32	18	15	17	20	17 and 15	11.0	4	0.05
18	28	19	13	8	32	18 and 17	11.3	4	0.05
20	46	10	9	13	22	20 and 18	11.5	3	0.01

Table 6.16 Question 14 (e)

There is a quite a spread of views at all ages. Views seem to move up and down with age. It might be expected that those aged 17 would be more positive in that they have moved to high school, with better resources. What is a matter of concern is that over one third at all ages hold negative views (right two boxes), suggesting that the resource levels in schools are far from adequate. This could be resolved easily in a country where there is so much wealth: "There is frequently not enough equipment and facilities at some schools (e.g. computers and laboratories)" (Khalifa, 2000, p. 15). According to Collis (1993) most students in Western European have access to computers and computer education is even compulsory in some European countries, such as Denmark and the United Kingdom. This suggests that access to a computer is important.

There are too many students in my class									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	34	15	16	11	24				
15	30	18	16	19	18	15 and 12	8.9	4	n.s.
17	41	16	11	16	16	17 and 15	8.6	4	n.s
18	37	17	16	15	15	18 and 17	4.4	4	n.s
20	49	13	10	12	16	20 and 18	5.7	3	n.s

Table 6.17 Question 14 (f)

In general, the differences between years groups are not very marked and there is a wide range of views. This does suggest that class size is not a big issue with school students in Libya although more feel that the numbers are too high than those who disagree. Of course, the students in Libya know no other than the sizes which they have experienced and, no doubt, they have learned to cope with these class sizes.

In order to pass my courses, I need to study just what the teacher tells me									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	37	13	9	9	32				
15	39	19	16	15	12	15 and 12	31.2	4	0.001
17	28	24	21	15	12	17 and 15	5.4	4	n.s
18	38	13	15	15	18	18 and 17	11.5	4	0.05
20	48	20	13	8	12	20 and 18	6.8	3	n.s

Table 6.18 Question 14 (g)

There is a high proportion strongly disagreeing with this statement in year 12 and this falls back very markedly with older age groups. This is probably because the 12 year olds have not yet faced formal examinations. Views becoming increasingly positive from ages 17 to 20. This reflects the dominance of the examination system as students become older. Passing involves the recall of exactly what has been taught and, with experience, the students appreciate this more and more. This is a worrying trend. Nonetheless, the range of views is wide.

My school does not have enough computers									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	51	8	7	8	25				
15	41	19	11	11	28	15 and 12	5.3	4	n.s
17	39	18	12	10	22	17 and 15	6.8	4	n.s
18	56	15	6	7	15	18 and 17	11.3	4	0.05
20	48	20	13	8	12	20 and 18	2.9	2	n.s

Table 6.19 Question 14 (h)

The first thing to observe is that views are polarised. There is tendency for less to disagree with age. Overall, the majority feel there are not enough computers which, for a country of such wealth, is a matter of concern: "There is frequently not enough equipment and facilities at some schools (e.g. computers and laboratories)" Khalifa (2000, p.15). Khalifa studied the place of new technology in education in Libyan schools and he found clear evidence of the reported feeling that educational technology was not well integrated into classroom instruction.

We cannot call anything scientific knowledge if it is not absolutely true									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	55	17	15	7	6				
15	44	21	16	12	8	15 and 12	8.0	4	n.s
17	47	27	16	4	6	17 and 15	5.3	3	n.s
18	54	16	17	4	9	18 and 17	5.9	3	n.s
20	51	25	16	3	7	20 and 18	2.9	2	n.s

Table 6.20 Question 14 (i)

There is a general naive view that scientific knowledge tends to be absolutely true, indicating that they have not seen the way knowledge is developed and that understandings can change with new evidence. While there are differences with age, there is no obvious trend other than moves between the first two columns.

I believe it is the job of the teacher to supply me with all the knowledge									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	84	7	4	2	3				
15	67	15	9	5	4	15 and 12	8.0	4	n.s
17	62	23	6	5	4	17 and 15	6.3	3	n.s
18	74	13	6	3	4	18 and 17	5.9	3	n.s
20	73	16	4	7	1	20 and 18	2.9	2	n.s

Table 6.21 Question 14 (j)

There is a general strong agreement with this statement with about 87% agreeing or strongly agreeing with the statement. Differences between age groups tend to be because of movements between the first two categories. Clearly, the idea of independent learning or student-centred learning has little place in the Libyan system. In the context of life-long learning, this is a matter of concern and reflects the 'spoon-feeding' approach where students merely memorise the information provided by the teachers.

All one has to do in science is to memorise things									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	57	13	5	4	21				
15	50	19	16	4	5	15 and 12	26.6	4	0.001
17	43	28	11	7	12	17 and 15	6.1	3	n.s
18	48	18	11	6	16	18 and 17	8.8	3	0.05
20	47	22	17	4	10	20 and 18	3.8	3	n.s

Table 6.22 Question 14 (k)

Although majorities always seem to agree, there are changes between year groups which do not seem to follow any clear trend. They probably merely reflect differences in experiences from year to year and these may be curriculum related. There is considerable polarisation of view, this being most marked at age 12 where the highest proportion of disagreement comes. It seems that this more enlightened view is rapidly destroyed by the teaching and learning processes, this being most marked at age 15. The exciting and demanding thing about the sciences is their conceptual basis and the need for understanding. It is a sad reflection on how learning has developed that so many see the subjects in terms of memorisation. However, this might simply reflect the way examinations are used.

My school is preparing me well for what I shall do later in life									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	64	18	9	1	7				
15	47	22	13	9	11	15 and 12	18.4	3	0.001
17	39	22	19	12	9	17 and 15	5.0	4	n.s
18	47	20	11	8	13	18 and 17	7.7	4	n.s
20	56	16	7	7	16	20 and 18	2.7	3	n.s

Table 6.23 Question 14 (l)

The early optimism of those aged 12 drops somewhat and then grows as the students are older. However, taking the final two columns together, there is growth in disagreement with age, suggesting an increasing inability to see what schools are doing as life preparation. This may be related to the difficulties in Libya to retain students in the school system. Some students fail to see that school is preparing them for life and, therefore, they may tend to opt out of school.

In exams, I like questions that give me the scope to go beyond what is taught and show my ability to think									
Age	**SA**	**A**	**N**	**D**	**SD**	**Compare**	χ^2	**df**	**sig**
12	80	8	4	2	5				
15	55	25	6	5	8	15 and 12	36.3	3	0.001
17	54	24	11	7	4	17 and 15	3.4	3	n.s
18	69	15	4	7	1	18 and 17	7.6	2	n.s
20	79	13	3	3	3	20 and 18	3.0	1	n.s

Table 6.24 Question 14 (m)

At the youngest age, the students are most positive. This falls (although mainly from strongly agree to agree) and then is restored by age 20. However, at all ages, this is a very strongly held student view with about 86% (columns 1 and 2 overall) expressing that they like questions that give them the scope to go beyond what is taught and show ability to think. Perhaps, it reflects the desire of students to break out from the stifling restrictions caused by examinations which merely tend to test recall skills and is consistent with the finding in 14(c) [see table 6.14]. It is even possible that it reflects a wider desire to move away from authoritative learning (where the role of the student is merely to accept, believe and recall what they are told). However, it might simply be wishful thinking without an appreciation of the difficulties which might be caused.

Summary

Looking at the fourteen questions overall, some general themes are evident. There is a general view that schools are preparing them for life. While they seem to want more freedom to think, question, and express themselves in classes and examinations, there is still the expressed need for security in factual knowledge which has been memorised.

Two questions were developed using ideas from Al-shibli (2003). In his study, he was looking at the way school students and university students in Oman (over a 7 year period) saw their learning, following the ideas of Perry (1999). In the survey here in Libya, it is clear that the students tend to see knowledge in black and white terms and the role of the teacher as a supplier of that knowledge (questions *i* and *j*). This is very similar to the findings by Al-shibli (2003). In this study in Libya, the students also saw science in terms of the memorisation of knowledge which is a sad reflection on the way the sciences are being presented in Libyan schools.

The students clearly wish to use new technology more and, in general, there is a wide range of views about resource levels in the schools, suggesting that there is a considerable scope for more resources and, specifically, for more computers.

Questions 15 to 19 follow a semantic differential format and are shown together in full. Each of the five questions is then discussed in turn.

(15) What are your opinions about your ***studies in science subjects***?
Tick ONE box on each line.

Not helpful	☐ ☐ ☐ ☐ ☐ ☐	Helpful
Easy to understand	☐ ☐ ☐ ☐ ☐ ☐	Not easy to understand
Boring	☐ ☐ ☐ ☐ ☐ ☐	Interesting
Well organised	☐ ☐ ☐ ☐ ☐ ☐	Not well organised
The best part of school	☐ ☐ ☐ ☐ ☐ ☐	The worst part of school
Not enjoyable	☐ ☐ ☐ ☐ ☐ ☐	Enjoyable

(16) What are your opinions about your ***studies in Arabic language***?
Tick ONE box on each line.

Not helpful	☐ ☐ ☐ ☐ ☐ ☐	Helpful
Easy to understand	☐ ☐ ☐ ☐ ☐ ☐	Not easy to understand
Boring	☐ ☐ ☐ ☐ ☐ ☐	Interesting
Well organised	☐ ☐ ☐ ☐ ☐ ☐	Not well organised
The best part of school	☐ ☐ ☐ ☐ ☐ ☐	The worst part of school
Not enjoyable	☐ ☐ ☐ ☐ ☐ ☐	Enjoyable

(17) What are your opinions about your ***studies in Mathematics***?
Tick ONE box on each line.

Not helpful	☐ ☐ ☐ ☐ ☐ ☐	Helpful
Easy to understand	☐ ☐ ☐ ☐ ☐ ☐	Not easy to understand
Boring	☐ ☐ ☐ ☐ ☐ ☐	Interesting
Well organised	☐ ☐ ☐ ☐ ☐ ☐	Not well organised
The best part of school	☐ ☐ ☐ ☐ ☐ ☐	The worst part of school
Not enjoyable	☐ ☐ ☐ ☐ ☐ ☐	Enjoyable

(18) What are your opinions about ***learning in school***?
Tick ONE box on each line.

I feel I am coping well	☐ ☐ ☐ ☐ ☐ ☐	I feel I am not coping well
I am not enjoying school	☐ ☐ ☐ ☐ ☐ ☐	I am enjoying school
I have found school work easy	☐ ☐ ☐ ☐ ☐ ☐	I found school work hard
My school results are getting worse	☐ ☐ ☐ ☐ ☐ ☐	My school results are getting better
School is benefitting me	☐ ☐ ☐ ☐ ☐ ☐	I am wasting my time at school
Work at school is relevant to my needs	☐ ☐ ☐ ☐ ☐ ☐	Work at school is irrelevant to my needs
My parents are interested in my education	☐ ☐ ☐ ☐ ☐ ☐	My parents are not interested in my education

(19) What are your opinions about ***learning approaches in school***?
Tick ONE box on each line.

I find my textbooks helpful	☐ ☐ ☐ ☐ ☐ ☐	I find my textbooks unhelpful
Examinations do not help me to learn	☐ ☐ ☐ ☐ ☐ ☐	Examinations help me to learn
I enjoy practical work at school	☐ ☐ ☐ ☐ ☐ ☐	I do not enjoy practical work at school
I like the way my school is run	☐ ☐ ☐ ☐ ☐ ☐	I do not like the way my school is run
School tells me what I have to memorise	☐ ☐ ☐ ☐ ☐ ☐	School encourages me to think for myself
Most subjects at school are useful	☐ ☐ ☐ ☐ ☐ ☐	Most subjects at school are not useful
I prefer working on my own	☐ ☐ ☐ ☐ ☐ ☐	I prefer working in a group

Question 15 Studies in Science Subjects

The sciences (biology, chemistry and physics) are an important part of the curriculum in Libyan schools and this question seeks to explore how students see these subjects in general terms. The three sciences are taught as one subject at Middle School level and, in order for the question to be accessible with the younger two age groups, the phrase 'science subjects' is used. This phrase also allows the older students to see that they are looking at the three subjects. Nonetheless, it would have been better to look at each subject separately and, therefore, the data obtained will only offer a general impression.

Studies in Science subjects: helpful ... not helpful										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	68	16	4	0	0	12				
15	64	15	5	1	2	13	15 and 12	1.8	3	n.s
17	47	19	13	3	3	15	17 and 15	12.9	3	0.01
18	42	13	9	4	3	29	18 and 17	8.5	3	0.05
20	42	12	7	5	3	31	20 and 18	0.5	2	n.s

Table 6.25 Question 15 (a)

There is a clear trend in the data, with fewer students seeing science subjects as helpful and more seeing it unhelpful as they get older. It is possible that one factor is the fact that a small proportion are not taking the sciences with the older age groups. There is also marked polarisation, probably reflecting that there are two general groupings at all stages: those who like the science subjects and those who do not. A potential arts-science divide is perhaps emerging.

Studies in Science subjects: Not easy to understand ... easy to understand										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	21	20	7	1	6	44				
15	26	18	10	6	10	30	15 and 12	9.3	3	n.s
17	31	19	14	7	12	17	17 and 15	13.3	4	0.01
18	43	12	12	4	6	24	18 and 17	29.7	5	0.001
20	42	21	8	8	5	17	20 and 18	4.1	3	n.s

Table 6.26 Question 15 (b)

The general pattern of responses in table 6.26 is very similar to that in table 6.25, with a growth in seeing studies in science subjects as difficult with age. This may simply reflect increasing complexity in the curriculum but it is consistent with the findings that the sciences are difficult (Johnstone and Kellett, 1980)

Studies in Science subjects: Interesting ... Boring										
Age	**A**	**B**	C	**D**	**E**	**F**	**Compare**	χ^2	**df**	**sig**
12	87	5	3	1	0	4				
15	74	10	8	2	2	4	15 and 12	8.6	2	0.01
17	66	13	11	1	5	5	17 and 15	5.6	3	n.s
18	71	7	8	2	3	9	18 and 17	5.4	3	n.s
20	74	7	5	4	1	9	20 and 18	0.2	2	n.s

Table 6.27 Question 15 (c)

In general, all groups see science subjects as interesting, this effect being most marked with age 12 and declining very slightly with age. The work of Reid and Skryabina (2002) in Scotland with physics showed very clearly the great importance of catching student interests early and how difficult it is to develop interest later. Science courses should be offering students insights into how the world works and this should be intrinsically interesting and this is what is seen here. After an initial drop off from age 12 to 15, the patterns are statistically similar.

Studies in Science Subjects: Well organised ... Not well organised										
Age	**A**	**B**	C	**D**	**E**	**F**	**Compare**	χ^2	**df**	**sig**
12	71	20	3	1	0	5				
15	56	16	10	6	4	8	15 and 12	25.8	2	0.001
17	48	18	14	6	4	11	17 and 15	3.3	3	n.s
18	60	12	9	4	3	12	18 and 17	6.2	3	n.s
20	52	16	5	8	4	15	20 and 18	0.7	2	n.s

Table 6.28 Question 15 (d)

Although all groups see the subjects as well organised, the proportion of positive views tends to fall with age and the proportion of negative views tends to increase with age, although often not significantly between successive age groups, leading to considerable polarisation of views at age 20. This probably simply reflects student maturation.

Studies in Science Subjects : The worst part of school ... The best part of school										
Age	**A**	**B**	C	**D**	**E**	**F**	**Compare**	χ^2	**df**	**sig**
12	21	13	10	2	5	49				
15	26	14	11	7	9	33	15 and 12	3.7	3	n.s
17	24	8	13	10	18	28	17 and 15	18.0	5	0.01
18	37	7	14	9	3	30	18 and 17	36.9	5	0.001
20	38	8	10	4	14	26	20 and 18	3.9	2	n.s

Table 6.29 Question 15 (e)

With the exception of the 17 year olds, the proportion seeing science as the 'worst part of school' tends to grow with age, with those seeing it as the 'best part of school' tending to fall with age although it rises again with the 20 year olds Presumably at this age, they have taken a decision for or against science and this is reflected in their views. Views tend to be highly polarised with all ages but the proportion of students holding negative views are quite high (first two columns), lying between about one third and one half of the populations. The size of the proportion of those who see their studies in science subjects negatively is matter of great concern, especially at the younger ages when attitudes tend to form. The polarisation almost certainly reflects an arts-science divide.

Studies in Science Subjects: Enjoyable ... not enjoyable										
Age	**A**	**B**	C	**D**	**E**	**F**	**Compare**	χ^2	**df**	**sig**
12	69	10	6	1	2	12				
15	57	14	10	7	3	9	15 and 12	21.6	4	0.001
17	43	21	8	8	8	12	17 and 15	18.0	5	0.01
18	42	10	12	9	2	25	18 and 17	49.6	5	0.001
20	36	12	13	7	9	23	20 and 18	1.3	3	n.s

Table 6.30 Question 15(f)

Although there are high proportions considering that studies in the science subjects are enjoyable, this falls steadily from a high of 79% at age 12 to 48% at age 20 (looking at the first two columns). Although there is some polarisation of views, the proportions (final two columns) seeing studies in the science subjects as not enjoyable grows with age. This pattern is consistent with previous questions.

Summary

Looking at the six questions relating to studies in science subjects, in all questions, there is a considerable degree of polarisation: students are very often *strongly* negative or *strongly* positive. However, in all the questions, the positive view is much greater. In most studies, positive attitudes relating to the sciences (especially chemistry and physics) tend to fall with age [see Skryabina (2000) where she found that the Scottish pattern deviated from the normal decline observed in most countries and was able to relate this to specific curriculum features]. Here, attitudes tend to become less positive with age although it has to be recognised that the samples at age 20 are not necessarily the same. Looking at how they see the science subjects in terms of being interesting, the attitudes are fairly universally strongly positive.

Question 16 Studies in Arabic Language

Studies in Arabic Language is a central part of the curriculum in Libyan schools and this question seeks to explore how students see this core subject.

Studies in Arabic Language: Helpful ... Not Helpful										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	62	16	4	1	2	15				
15	58	13	6	4	3	16	15 and 12	5.4	3	n.s
17	49	20	9	5	3	14	17 and 15	5.7	4	n.s
18	71	7	3	6	2	11	18 and 17	12.0	4	0.05
20	63	12	5	4	4	12	20 and 18	10.9	2	n.s

Table 6.31 Question 16(a)

Views are polarised for every age group with the vast majority (around 74%) holding positive views. Students aged 17 are least positive but, even here, a majority hold positive views.

Studies in Arabic Language: Not easy to understand ... easy to understand										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	26	13	3	1	7	50				
15	23	18	8	8	11	32	15 and 12	34.5	3	0.001
17	25	9	15	11	12	28	17 and 15	10.0	5	0.05
18	27	9	8	7	6	43	18 and 17	12.8	5	0.05
20	16	10	8	14	17	35	20 and 18	5.4	3	n.s

Table 6.32 Question 16 (b)

Views are highly polarised, this effect being least with age 17. In each age group, about 50% (final two columns) see Studies in Arabic language as easy to understand. However, looking at the first two columns, a large minority see Studies in Arabic language as *not* easy to understand although this declines with age. Much of the problem may rest with the problem of shortage of teachers meaning that many teachers are not qualified in Arabic language.

Studies in Arabic Language: Interesting ... boring										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	80	6	5	0	1	8				
15	64	10	10	5	3	8	15 and 12	14.1	3	0.001
17	57	19	10	4	4	6	17 and 15	6.3	3	n.s
18	77	7	7	4	2	3	18 and 17	17.2	3	0.001
20	68	12	4	1	8	7	20 and 18	3.4	2	n.s

Table 6.33 Question 16 (c)

Although there is slight polarisation of views, the most obvious trend is the general agreement that Studies in Arabic language are interesting, with around four fifths of all students holding this perception.

Studies in Arabic Language: Well organised ... Not well organised										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	69	12	9	2	1	7				
15	57	15	7	5	5	11	15 and 12	12.7	3	0.01
17	53	15	15	5	4	8	17 and 15	7.7	4	n.s.
18	69	10	9	6	0	6	18 and 17	11.3	4	0.05
20	61	14	5	4	5	11	20 and 18	1.7	2	n.s.

Table 6.34 Question 16 (d)

Although views are slightly polarised, the general view is that Studies in Arabic language are well organised, this view declining steadily with age.

Studies in Arabic Language: The worst part of school ... the best part of school										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	25	14	6	2	5	47				
15	28	16	12	8	9	27	15 and 12	6.6	3	n.s.
17	17	8	15	14	18	28	17 and 15	18.0	5	0.01
18	22	8	9	10	5	46	18 and 17	4.5	4	n.s.
20	19	3	6	17	16	39	20 and 18	1.7	2	n.s

Table 6.35 Question 16 (e)

The polarisation is very marked here, with negative views declining with age. With many age groups, over one half hold positive views (last two boxes).

Studies in Arabic Language: Enjoyable ... not enjoyable										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	69	7	9	2	1	11				
15	50	10	13	7	5	15	15 and 12	18.3	3	0.001
17	42	16	12	8	8	14	17 and 15	5.0	3	n.s
18	60	9	9	9	2	11	18 and 17	4.7	4	n.s
20	57	10	12	8	3	10	20 and 18	7.4	2	0.05

Table 6.36 Question 16 (f)

Again, views are highly polarised, with large numbers considering that Studies in Arabic language are enjoyable.

Summary

In all six questions relating to studies in Arabic language, the students are positive and this seems to be spread over all age groups. In four of the questions, there is considerable polarisation of view, with few students holding more neutral opinions. However, the student views suggest that the subjects not causing any major problems although teachers shortages may be a source of difficulty (see question 16(b))

Question 17 Studies in Mathematics

After studies in Arabic language, mathematics is the second most important part of the curriculum in Libyan schools and this question seeks to explore how students see this core subject.

Studies in Mathematics: Helpful ... not helpful										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	68	18	2	0	2	10				
15	54	14	4	5	6	17	15 and 12	18.5	2	0.001
17	39	15	7	8	6	25	17 and 15	7.5	2	0.01
18	43	7	7	9	4	30	18 and 17	6.8	4	n.s
20	31	9	8	14	8	30	20 and 18	2.4	2	n.s

Table 6.37 Question 17 (a)

There is marked polarisation of views with all groups. The proportion seeing mathematics as *not* helpful (right hand two boxes) grows with age, while the proportion seeing mathematics as helpful (left hand two boxes) falls. This is not an encouraging trend. However, it is possible that the statement could be related to ability about studying mathematics.

Studies in Mathematics: Not easy to understand Easy to understand										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	37	14	6	1	6	37				
15	46	17	8	7	7	15	15 and 12	20.0	3	0.001
17	47	19	10	5	5	14	17 and 15	40.3	5	0.001
18	52	8	9	8	6	17	18 and 17	17.1	5	0.001
20	55	13	12	3	7	10	20 and 18	5.2	3	n.s

Table 6.38 Question 17 (b)

Again, polarisation of views is present. However, the proportion seeing mathematics as *not* easy to understand (left-hand two boxes) grows with age while the proportion seeing mathematics as easy to understand (right-hand two boxes) declines with age. This may simply reflect increasing demand levels as the student progresses through the mathematics curriculum.

Studies in Mathematics: Interesting ... boring										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	85	8	3	0	1	3				
15	58	13	13	4	4	8	15 and 12	45.5	3	0.001
17	44	21	11	8	4	12	17 and 15	10.3	4	0.01
18	57	8	8	6	3	18	18 and 17	16.3	4	0.01
20	53	16	13	1	4	13	20 and 18	6.5	3	n.s

Table 6.39 Question 17(c)

There is some polarisation of views with the older groups but the strong observation is the high proportion who find their studies in mathematics interesting Looking at the left hand two boxes, this is highest for the 12 year olds, at 93%, but it does fall back quite markedly with the older groups although this shows a tendency to become more neutral in their views.

Studies in Mathematics: Well organised ... Not well organised										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	76	12	4	2	1	5				
15	55	12	9	9	5	10	15 and 12	3.7	3	n,s
17	41	22	13	7	3	14	17 and 15	11.2	4	0.01
18	53	10	13	5	3	16	18 and 17	10.7	3	0.01
20	40	15	13	7	7	18	20 and 18	4.2	3	n.s

Table 6.40 Question 17(d)

As with the courses in the sciences and Arabic language, the general view is that their studies in mathematics are well organised, this declining with age.

The best bart of school ... The worst part of school										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	34	11	7	1	8	39				
15	37	15	7	10	13	18	15 and 12	3.1	3	n.s
17	34	15	16	10	7	18	17 and 15	10.4	5	0.05
18	45	7	13	7	7	21	18 and 17	9.9	5	0.05
20	36	9	17	9	7	22	20 and 18	1.7	2	n.s

Table 6.41 Question 17 (e)

Views are highly polarised and the differences between age groups largely reflect large proportional differences in small numbers opting for more neutral positions. Thus, some students love mathematics while others seem to hate it. Mathematics seems to be particularly dependent on the quality of teacher and the result here might simply reflect diversity of teachers. Of course, the data might suggest that many students simply are mathophobes, a finding observed in some other countries (Forcheri and Moifino, 1995)

Studies in Mathematics: Enjoyable ... Not enjoyable										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	71	8	6	2	2	11				
15	49	10	12	8	8	14	15 and 12	28.3	3	0.001
17	35	11	11	17	6	20	17 and 15	11.6	4	0.01
18	42	5	11	9	7	26	18 and 17	5.5	4	n.s
20	33	7	12	20	4	26	20 and 18	4.0	2	n.s

Table 6.42 Question 17 (f)

Views are polarised but there is a clear trend with less students opting for the left-hand two boxes (enjoyable) with age while the parallel right hand boxes grow in popularity. Overall, enjoyment falls with age, especially after age 12.

Summary

In every measurement, there is strong polarisation of views with some students holding very positive views while others hold very negative views. Studies in mathematics in Libya clearly divide the school population very markedly. However, in all the measurements, the positive views are more obvious. In most measurements the extent of positive views falls with age, sometimes quite markedly. There do seem to be problems with mathematics in that, while it is attractive to many, it is a source of problems for a large number.

6.5 Some Comparisons

Questions 15, 16 and 17 asked the same questions of the three main subject areas of the curriculum. It is possible to compare the students views in each of the six parts of these three questions. While this could be done separately for each of the five year groups, it would be difficult to interpret the patterns obtained. For clarity, the responses for all five age groups were added together to offer an overall comparison. The analysis was carried out using chi-square as a contingency test. With a total sample of 859, chi-square becomes very sensitive and, therefore, it is perhaps safer only to consider differences when they are significant at $p < 0.01$ or less.

859	*Helpful ... not helpful*						Compare	χ^2	df	sig
Science subjects	56	15	7	2	2	18	**SC/AR**	16.6	4	0.01
Arabic	61	14	5	4	3	14	**SC/MA**	12.4	3	0.01
Mathematics	51	13	5	6	5	20	**AR/MA**	25.1	4	0.001

Table 6.43 Comparison 1

While there is some polarisation of responses, this is most marked with mathematics and least with Arabic. Arabic is regarded best in terms of helpfulness and mathematics as least.

859	*Not easy ... easy to understand*						Compare	χ^2	df	sig
Science Subjects	30	18	10	5	8	29	**SC/AR**	31.9	5	0.001
Arabic	24	13	8	7	10	39	**SC/MA**	48.5	5	0.001
Mathematics	46	14	8	5	6	21	**AR/MA**	117.5	5	0.001

Table 6.44 Comparison 2

With all three subjects, there is a high degree of polarisation. It is very clear that Arabic is regarded as much easier than the other two. This is consistent with the pattern where the mathematics and sciences subjects are often regarded as the most difficult subjects in the school curriculum. Being more conceptual, they place increase demands on working memory (Johnstone, 1991).

859	*Interesting ... boring*						Compare	χ^2	df	sig
Science subjects	75	8	7	2	2	6	**SC/AR**	8.3	4	ns.
Arabic	70	10	8	3	3	7	**SC/MA**	34.9	4	0.001
Mathematics	62	12	9	4	3	10	**AR/MA**	11.2	4	0.05

Table 6.45 Comparison 3

There is little polarisation with very positive views being expressed. However, mathematics is regarded as least interesting of the three.

859	*Well organised ... Not well organise*						Compare	χ^2	df	sig
Science subjects	59	17	8	4	3	9	**SC/AR**	6.0	4	ns.
Arabic	62	13	9	4	3	8	**SC/MA**	9.1	4	ns.
Mathematics	56	14	10	6	3	11	**AR/MA**	9.6	4	0.05

Table 6.46 Comparison 4

Clearly, the students regard all three subjects as well organised, with little differences between the three subjects.

859	*Worst part ... best part of school*						Compare	χ^2	df	sig
Science subjects	28	11	12	6	9	35	**SC/AR**	11.5	5	0.05
Arabic	23	11	10	9	9	38	**SC/MA**	29.7	5	0.001
Mathematics	37	12	11	7	9	24	**AR/MA**	57.9	5	0.001

Table 6.47 Comparison 5

All three subjects show quite remarkable view polarisation: students hold strong views about all three subject areas. Mathematics stands out as the the subject where students hold the least positive views.

859	*Enjoyable ... not enjoyable*						Compare	χ^2	df	sig
Science subjects	53	13	9	6	4	15	**SC/AR**	8.7	5	ns.
Arabic	56	10	11	6	4	12	**SC/MA**	22.4	5	0.001
Mathematics	50	8	10	9	6	18	**AR/MA**	24.0	5	0.001

Table 6.48 Comparison 6

Again, polarisation of views can be seen but, as with previous questions, mathematics shows as the subject which is regarded as least enjoyable.

Looking at the comparisons overall, one striking feature is the great similarities in the general trends observed in all the six questions. However, Arabic studies are regarded as most helpful and are the easiest while studies in Mathematics are least interesting, least enjoyable and the least attractive part of school.

Question 18 Opinions about learning in school

Learning in school: I am feel I am coping well ... I feel I am not coping well										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	**80**	10	3	0	1	6				
15	**66**	15	9	2	3	5	15 and 12	10.9	2	0.01
17	**61**	14	13	3	3	6	17 and 15	2.2	3	n.s
18	**65**	11	11	2	2	9	18 and 17	1.0	3	n.s
20	**69**	10	7	1	0	13	20 and 18	0.9	2	n.s

Table 6.49 Question 18 (a)

The aim of this question was to find out how students feel towards their experience at school in terms how well they cope. It is clear that, overall, the students tend to be positive.

Learning in school: I am enjoying school ... I am not enjoying school										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	**79**	12	4	1	1	2				
15	**61**	17	7	6	3	6	15 and 12	20.1	3	0.001
17	**53**	25	11	4	4	4	17 and 15	5.9	3	n.s
18	**60**	12	10	3	2	13	18 and 17	9.9	3	0.05
20	**61**	12	8	2	0	17	20 and 18	0.4	2	n.s

Table 6.50 Question 18 (b)

The views of students are very positive, especially at age 12.

Learning in school: I have found school work easy ... I found school work hard										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	64	12	9	3	3	9				
15	40	16	14	8	7	15	15 and 12	28.2	3	0.001
17	35	25	18	7	9	6	17 and 15	8.9	4	0.05
18	73	10	8	3	2	4	18 and 17	3.2	3	n.s
20	54	18	14	3	3	8	20 and 18	3.3	3	n.s

Table 6.51 Question 18 (c)

There is no clear trend in their views with age although age 15 seems different. The results may simply reflect their experiences at specific times when the questionnaires were used. Again, the result show very strong positive attitudes.

Learning in school: My school results are getting better ... My school results are getting worse										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	72	13	7	2	2	4				
15	63	15	10	5	3	4	15 and 12	5.7	3	n.s
17	50	27	13	6	4	0	17 and 15	11.8	3	0.05
18	64	15	11	3	1	6	18 and 17	8.8	3	0.05
20	56	25	7	7	1	5	20 and 18	1.8	2	n.s

Table 6.52 Question 18(d)

Students' views are universally positive although they this is most marked at age 12.

School is benefitting me ... wasting my time at school										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	82	9	6	1	1	1				
15	73	10	7	5	3	2	15 and 12	9.7	3	0.05
17	72	12	7	3	1	5	17 and 15	0.3	3	n.s.
18	76	8	9	0	1	6	18 and 17	1.9	3	n.s
20	61	10	8	7	1	13	20 and 18	5.9	2	0.05

Table 6.53 Question 18(e)

It is clear that all groups have strongly positive agreement with the statement.

Learning in school: Relevant to my needs ... irrelevant to my needs										
Age	**A**	**B**	C	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	83	7	8	1	1	1				
15	71	10	7	4	5	3	15 and 12	7.0	2	0.05
17	60	19	8	5	3	5	17 and 15	8.4	4	n.s
18	74	11	7	2	1	5	18 and 17	8.3	3	n.s
20	58	13	9	4	5	11	20 and 18	8.7	2	0.05

Table 6.54 Question 18(f)

Again, very positive views are observed.

Learning in school: My parents: interested in my education ... not interested in my education										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	78	10	7	1	1	3				
15	72	12	6	5	3	2	15 and 12	4.3	3	n.s
17	69	16	6	4	1	4	17 and 15	1.7	3	n.s
18	70	8	10	4	2	6	18 and 17	6.3	3	0.05
20	69	6	10	3	3	9	20 and 18	1.1	2	n.s

Table 6.55 Question 18(g)

In general, all groups strongly agree with the statement, although some significant differences are found. It is encouraging that the students are saying that their parents are supporting them in their studies.

Summary

A number of general patterns can be observed. Student views are very positive in many areas with those aged 12 being particularly positive. Thus, students indicate that they are coping well, enjoying and benefitting from school, finding their studies easy and relevant as well as being confident that their results are getting better. There is more or less no polarisation of views in these areas.

Education holds a high status in much of Libyan society simply because it is seen as opening doors for jobs and life opportunities. Thus, with very strong social cohesion, the school students will tend to look upon their educational journey with a positive view. They see it as the way ahead for them, a key to the future, especially in a country where science and technology as well as business are seen as the keys to an economic future. The pattern of responses here seems consistent with such a context.

Question 19 Learning Approaches in Schools

I find my textbooks helpful ..... I find my textbooks unhelpful										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	81	13	4	0	0	2				
15	75	10	7	1	3	4	15 and 12	9.1	2	0.01
17	66	11	10	3	4	6	17 and 15	4.4	3	n.s
18	74	7	7	2	1	9	18 and 17	4.4	3	n.s
20	75	9	5	1	2	8	20 and 18	0.2	2	n.s

Table 6.56 Question 19(a)

All groups show very large majorities who are positive about the textbooks. The school courses are very much based on textbooks with teachers giving lectures to cover the ground and explain things. Examination success depends, therefore, very much on memorising what is in the textbooks.

Learning approaches in school: Examinations help me to learn ... Examinations do not help me to learn										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	78	15	4	3	0	0				
15	63	18	8	3	5	3	15 and 12	13.7	2	0.01
17	45	32	11	4	4	4	17 and 15	11.8	3	0.01
18	64	16	6	3	2	9	18 and 17	17.3	3	0.001
20	61	16	9	4	1	9	20 and 18	1.3	3	n.s

Table 6.57 Question 19(b)

It is fascinating to see the view that examinations help them to learn. In the Libyan system, there is great emphasis on memorisation and examinations largely test recall. Passing examinations controls entry to the next year of education. Thus, the examinations may be acting as a very powerful influence in ensuring the students memorise, the incentive being that failure will mean a year to be repeated. Examinations can often have this effect (See for example Oraif (2007, p. 80) who found, in Saudi Arabia, that "there is a tendency for females who like taking risks not to do so well in examinations. This is difficult to interpret but may simply reflect that examinations do not involve risks").

Learning approaches in school: I enjoy practical work at school ... I do not enjoy practical work at school										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	74	9	6	2	3	6				
15	53	17	9	6	6	9	15 and 12	11.4	2	0.01
17	56	15	8	6	7	8	17 and 15	0.6	3	n.s
18	61	12	8	4	3	12	18 and 17	0.9	3	n.s
20	53	10	11	12	5	9	20 and 18	4.2	2	n.s

Table 6.58 Question 19(c)

While most students have positive attitudes towards practical work, those aged 12 are significantly more positive. However, with the overloaded curricula, practical work in schools is sometimes not undertaken.

Learning approaches in school: I like the way my school is run ... I do not like the way my school is run										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	72	11	8	1	1	7				
15	52	10	13	6	6	13	15 and 12	27.0	3	0.001
17	33	25	12	9	4	17	17 and 15	21.2	4	0.001
18	40	14	12	4	4	26	18 and 17	6.6	3	n.s
20	39	19	12	5	8	17	20 and 18	0.7	2	n.s

Table 6.59 Question 19(d)

It is clear that there is some polarisation of views. As they get older, they become less positive in general, perhaps reflecting developing adolescent views.

Learning approaches in school: School tells me what I have to memorise ... school encourages me to think for myself										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	**72**	12	7	2	1	6				
15	**59**	15	9	5	5	7	15 and 12	9.9	3	0.05
17	**45**	23	13	6	4	9	17 and 15	7.4	3	0.05
18	**52**	13	11	4	2	18	18 and 17	6.2	3	n.s
20	**52**	12	9	10	5	12	20 and 18	0.9	2	n.s

Table 6.60 Question 19(e)

Slight polarisation is again observed while the emphasis on memorisation falls with age and the 'thinking for myself' grows with age. Perhaps the older students appreciate there is more to learning than memorisation. It is, however, sad, to see about 70% overall (columns 1 and 2) seeing school as a place which directs a process of memorisation.

Learning approaches in school: Most subjects at school are useful ... Most subjects at school are not useful										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	**77**	10	7	2	0	4				
15	**55**	15	9	4	6	11	15 and 12	23.6	2	0.001
17	**59**	19	9	2	4	7	17 and 15	4.9	3	n.s
18	**65**	13	7	4	2	9	18 and 17	3.5	3	n.s
20	**60**	10	7	5	1	17	20 and 18	3.2	2	n.s

Table 6.61 Question 19(f)

Students are very positive at all ages, especially aged 12.

Learning approaches in school: I prefer working on my own ... I prefer working in a group										
Age	**A**	**B**	**C**	**D**	**E**	**F**	**Compare**	**χ^2**	**df**	**sig**
12	**51**	5	9	1	3	**31**				
15	**44**	9	7	6	8	**26**	15 and 12	5.1	3	n.s
17	**54**	13	6	4	4	**19**	17 and 15	6.9	2	0.05
18	**54**	7	7	3	3	**26**	18 and 17	1.5	2	n.s
20	**44**	11	9	9	4	**23**	20 and 18	4.0	2	n.s

Table 6.62 Question 19(g)

Clearly, at all ages, some students are very much in favour of working on their own while others are very much in favour of working in a group. In general, group work is rarely used in schools in Libya. Their views will, therefore, be based on lack of experience. The place and role of group work is well researched and shown to be of considerable value, especially in problem solving (see the review by Qin *et al.*, 1995).

Summary

There are universally positive views towards textbooks, examinations, practical work, subject usefulness and the fact that memorisation is the key. Perhaps reflecting their lack of experience, group work shows a polarisation of view while school organisation also does not command universal support.

6.6 Conclusions

Looking at the first survey of this research, the field work was designed to offer some kind of overview of students' views about certain aspects of their school experiences, the emphasis being on looking for trends with age. This involved: students' attitudes towards studying in school, towards main curriculum subjects and towards their future career.

The responses to the many questions give an overall picture where the students are fairly positive about their school experiences and the learning approaches which are used. However, in a number of questions, there seems to be an expressed wish for freedom: freedom to question, freedom to express themselves, freedom to be released from the dominance of memorisation and recall. Despite this, they still rely on the security of factual knowledge which is regarded in black and white terms. Teachers are seen as the sources of such knowledge and, even in their science subjects, memorisation still holds power. All of this reflects a system where the teacher is an authority figure, often seen as beyond question, and the curriculum is based tightly on prescribed textbooks and lecture type presentations.

Looking at the three major curriculum areas (Arabic, sciences, mathematics), Arabic is regarded best and there is a steady decline in positive attitudes when considering most aspects of learning in mathematics. It is somewhat surprising that such high proportions of students elect to pursue studies which specialise in the sciences and in technology. However, this might simply reflect the nature of perceived future jobs in Libya. The popularity of the Arts area is amazingly low. This strongly relates to the absence of job opportunities in this area in Libya.

The early questions indicate a quite dramatic change in social structures relating to educational opportunities. The opportunities for girls education have grown enormously in a very short space of time. At the same time, family sizes are dropping rapidly. This is a common pattern (Knodel *et* al., 1990). Clearly, resource levels in schools (especially with regard to computers) have not matched the pace of growth in education.

This study is a first attempt to gain an overall view of education provision over the age range of 12-20 in Libya (middle and high schools), looking for general trends and patterns. In the next phase of the study, the focus will be on students in their final years of high school education. This will involve more detailed consideration of the three main subject

areas along with the study of English (which is the key second language taught in Libya). At this stage, the students are able to look back at their educational journey as well as look forward to the next stages of higher education or employment. It is hoped that these students can offer a picture of the strengths and weaknesses of the Libyan educational system and point to ways by which it can be improved or developed.

Chapter Seven

The Second Survey

7.1 Introduction

Chapter 6 described the outcomes from the first experiment. There, the purpose was to gain a general overview of the educational situation from age 12 to 20 in Libya. One aim was to look for trends as the student move up through the system.

This chapter discusses the outcomes from the second experiment. Here, the aim is to focus on the final two years of secondary school (years 3 and 4). Students are able to reflect on their educational journey as they approach the end of schooling; and university, college or jobs are in the imminent future.

The results have shown that interest in some subjects declines as students grow older. This chapter focusses specifically on Arabic, English, Mathematics and the Sciences, these being the major subjects in the curriculum. In addition, some questions seek to probe what the students see as the best and worst features in their school life, with an opportunity to suggest what they would like for the future.

7.2 Organisation

The second questionnaire involved 45 questions and this was distributed to large groups of students age (17-19). This involved eight schools, these being selected to represent a typical range of Libyan schools. As before, it was not easy to gain access to schools and, in particular, access to boys schools proved exceptionally difficult.

The questionnaire was applied in the final two years of schooling. These samples are shown in table 7.1. A large number (343) of students were involved aged 17-19, drawn from eight different schools (see Table 7.1).

Number of Pupils from each year of study in 2004/2005				
Schools	**Gender**	**Age 17-18**	**Age 18-19**	**Total**
1	girls	49	55	104
2	girls	16	57	73
3	girls		33	33
4	girls		30	30
5	girls		26	26
6	boys		29	29
7	boys	19		19
8	boys	30		30
Totals		**114**	**230**	**344**
Percentage		**33%**	**67%**	**100%**

Table 7.1 Sample for Experiment 2

The gender balance varies considerably from year group to year group as access to students was sometimes difficult (see table 7.2).

Age	Boy	Girl	Total
17-18	49	65	114
18-19	29	201	230
Totals	**78**	**266**	**344**
Percentage	**23%**	**77%**	**100%**

Table 7.2 Sample for Experiment 2 (Gender)

7.3 Questionnaire

To give an overall view of the questionnaire, the 45 questions are shown in full. The actual layout as used with the students is shown in the appendix.

How You See Your Studies?

(1) Think about your school studies in Arabic language
Tick one box on each line to indicate your view.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
(a) It is essential to be able to write Arabic clearly and accurately	☐	☐	☐	☐	☐
(b) Too much emphasis was placed on Arabic literature in my studies	☐	☐	☐	☐	☐
(c) I find studying Arabic grammar difficult	☐	☐	☐	☐	☐
(d) My studies in Arabic did not help me to read more	☐	☐	☐	☐	☐
(e) The examinations system affects the development of my Arabic skill	☐	☐	☐	☐	☐
(f) My studies in Arabic prepare me well for further study	☐	☐	☐	☐	☐
(g) The time for each Arabic class is enough	☐	☐	☐	☐	☐

(2) Think about your school studies in English language
Tick one box on each line to indicate your view.

(a)	Learning English is essential in today's world	☐	☐	☐	☐	☐
(b)	The most important skills is being able to speak English	☐	☐	☐	☐	☐
(c)	Reading English is essential for those involved in science and technology	☐	☐	☐	☐	☐
(d)	Learning English should be started at a very young age.	☐	☐	☐	☐	☐
(e)	English is helpful in many activities when I leave school.	☐	☐	☐	☐	☐
(f)	English textbooks are not helpful	☐	☐	☐	☐	☐
(g)	English language will help me in my future career	☐	☐	☐	☐	☐
(h)	My school has proper audiovisuals aids for learning English	☐	☐	☐	☐	☐
(i)	Most of the time we talk Arabic during the English lessons	☐	☐	☐	☐	☐

(3) Think about your school studies in science subjects (biology, chemistry and physics)
Tick one box on each line to indicate your view.

(a)	Science is too dominated by Western thought	☐	☐	☐	☐	☐
(b)	My studies have helped me to make sense of the world around	☐	☐	☐	☐	☐
(c)	Learning science successfully depends too much on having a good memory	☐	☐	☐	☐	☐
(d)	My textbooks were not easy to understand	☐	☐	☐	☐	☐
(e)	Science is often far too difficult	☐	☐	☐	☐	☐
(f)	Much of my science was unrelated to life	☐	☐	☐	☐	☐
(g)	The curriculum of science does not suit me	☐	☐	☐	☐	☐
(h)	It would help me get a good job in the future	☐	☐	☐	☐	☐
(i)	Studying science can make our live healthier	☐	☐	☐	☐	☐
(j)	A good thing about learning science is the fact that everything is so clear-cut: either right or wrong	☐	☐	☐	☐	☐

(4) Think about your school studies in mathematics
Tick one box on each line to indicate your view.

(a)	I find mathematics to be very useful in daily life	☐	☐	☐	☐	☐
(b)	Mathematics is only needed by those studying subjects like the sciences	☐	☐	☐	☐	☐
(c)	Some pupils can 'do' mathematics, others cannot 'do' mathematics	☐	☐	☐	☐	☐
(d)	Mathematics tends to be too abstract	☐	☐	☐	☐	☐
(e)	I find mathematics easy	☐	☐	☐	☐	☐
(f)	Mathematics is definitely my subject	☐	☐	☐	☐	☐
(g)	My mathematics class was more interesting than other subjects	☐	☐	☐	☐	☐
(h)	Mathematics is not preparing me well for further study	☐	☐	☐	☐	☐

(5) Think about the way you were tested in school tests and examinations.
Tick one box on each line to indicate your view.

(a)	There is too much emphasis on memory skills	☐	☐	☐	☐	☐
(b)	Examination and test results made me feel a failure.	☐	☐	☐	☐	☐
(c)	I like the way examinations were organised	☐	☐	☐	☐	☐
(d)	Test and examinations in Arabic seem unrelated to the real use the language	☐	☐	☐	☐	☐
(e)	Tests in the sciences involved little more than recalling facts	☐	☐	☐	☐	☐
(f)	I think that the examinations system affects the development of my skills	☐	☐	☐	☐	☐
(g)	The quality of the curriculum is vital to encourage students to stay at school	☐	☐	☐	☐	☐
(h)	I like mathematics tests and examinations because they gave me scope to show my understanding.	☐	☐	☐	☐	☐

(6) Imagine you are the adviser to a government minister in charge of secondary school education. He asks you for the three best features they would like and the three worst features.
List these, using one sentence to describe each.

(7) In three sentences, write down what you consider to be the most important reasons for pupils working hard until they complete their secondary education

(8) Imagine you are living in the year 2020. In what ways will secondary education in Libya have to change to meet the needs of the future? Describe these in no more than three sentences.

As before, the questions were analysed separately. The tables show the response patterns for the entire year groups (3rd and 4th years), followed by the patterns for the boys and girls separately for each year group. The data are shown as percentages for clarity. Chi-square was used as a contingency test to compare between groups and was calculated using the actual frequencies. Some occasions, the low samples for boys and girls make it impossible for the chi-square to be calculated meaningfully.

7.4 Data Analysis

(1) Think about your school studies in Arabic language

(a) It is essential to be able to write Arabic clearly and accurately

Gender	Groups	sa	a	n	d	sd	Compare	χ^2	df	sig
All	4th	73	25	2	0	0				
All	3rd	61	36	1	2	0	3rd and 4th years	4.4	1	0.05
Girls	4th	73	25	2	0	1	girls 4th and 3rd	1.1	1	n.s
Girls	3rd	66	31	2	2	0	boys 4th and 3rd	1.5	1	n.s
Boy	4th	69	24	3	3	0	3rd boys and girls	1.4	1	n.s
Boy	3rd	55	43	0	2	0	4th boys and girls	0.2	1	n.s

Table 7.3 Question 1 (a)

As might be expected, the vital importance of writing Arabic clearly and accurately is appreciated with all groups, with the older group seeing this slightly more strongly.

(b) Too much emphasis was placed on Arabic literature in my studies

Gender	Groups	sa	a	n	d	sd	Compare	χ^2	df	sig
All	4th	17	45	20	16	2				
All	3rd	26	36	23	11	4	3rd and 4th years	6.1	3	n.s
Girls	4th	18	46	19	16	2	girls 4th and 3rd	4.7	3	n.s
Girls	3rd	29	34	20	14	3	boys 4th and 3rd	3.4	2	n.s
Boy	4th	7	41	24	21	7	3rd boys and girls	1.6	3	n.s
Boy	3rd	22	39	27	8	4	4th boys and girls	2.7	1	n.s

Table 7.4 Question 1 (b)

In general, there is a tendency for all groups to consider that literature had too high a place in their studies, this becoming slightly less marked with the older groups. It perhaps suggests that the perceived role of Arabic studies is more towards the skills of communication, a utilitarian approach.

(c) I find studying Arabic grammar difficult										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	χ^2	**df**	**sig**
All	4th	16	20	9	38	17				
All	3rd	25	34	17	18	6	3rd and 4th years	30.5	3	0.001
Girls	4th	15	19	8	41	18	girls 4th and 3rd	17.5	3	0.001
Girls	3rd	26	31	14	19	11	boys 4th and 3rd	1.0	2	n.s
Boy	4th	21	31	21	17	10	3rd boys and girls	3.2	3	n.s
Boy	3rd	25	39	20	16	0	4th boys and girls	3.7	1	0 05

Table 7.5 Question 1 (c)

Groups change to increasing disagreement with age, the effect appearing more marked for the girls. This is encouraging in that they are seeing Arabic grammar as becoming easier with age.

(d) My studies in Arabic did not help me to read more										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	χ^2	**df**	**sig**
All	4th	5	15	12	37	32				
All	3rd	12	18	20	24	25	3rd and 4th years	15.1	4	0.01
Girls	4th	5	14	12	36	33	girls 4th and 3rd	4.5	3	n.s
Girls	3rd	12	9	22	28	29	boys 4th and 3rd	2.8	1	n.s
Boy	4th	3	21	10	41	24	3rd boys and girls	6.2	3	n.s
Boy	3rd	12	31	18	18	20	4th boys and girls	0.4	1	n.s

Table 7.6 Question 1 (d)

In general, views are widely spread with the greater numbers tending to disagree, this growing with age.

(e) The examinations system affects the development of my Arabic skill										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	χ^2	**df**	**sig**
All	4th	13	13	27	31	17				
All	3rd	28	17	22	25	9	3rd and 4th years	15.6	4	0.01
Girls	4th	13	12	29	30	17	girls 4th and 3rd	5.5	2	0.05
Girls	3rd	28	12	25	25	11	boys 4th and 3rd	3.1	1	n.s
Boy	4th	14	17	14	38	17	3rd boys and girls	1.4	2	n.s
Boy	3rd	29	22	18	25	6	4th boys and girls	0.5	1	n.s

Table 7.7 Question 1 (e)

A wide range of views is evident but disagreement grows with age. There is clearly considerable uncertainty about the effect of examinations on Arabic skills, perhaps this reflecting uncertainty in that the students have never studied without examinations.

(f) My studies in Arabic prepare me well for further study										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	39	44	8	8	1				
All	3rd	42	34	12	7	4	3rd and 4th years	4.0	3	n.s
Girls	4th	31	43	8	9	1	girls 4th and 3rd	2.2	3	n.s
Girls	3rd	46	32	9	6	6	boys 4th and 3rd	2.9	1	n.s
Boy	4th	35	55	7	3	0	3rd boys and girls	1.0	2	n.s
Boy	3rd	37	37	16	8	2	4th boys and girls	0.3	1	n.s

Table 7.8 Question 1 (f)

In general, all groups tend to agree with the statement. The importance of mother language for other studies seems well established.

(g) The time for each Arabic class is enough										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	17	46	19	14	5				
All	3rd	19	37	21	10	13	3rd and 4th years	9.8	4	0.05
Girls	4th	18	47	16	16	5	girls 4th and 3rd	2.0	3	n.s
Girls	3rd	23	37	17	11	12	boys 4th and 3rd	0.1	1	n.s
Boy	4th	14	41	41	0	3	3rd boys and girls	1.6	2	n.s
Boy	3rd	14	37	27	8	14	4th boys and girls	0.8	1	n.s

Table 7.9 Question 1 (g)

The fourth year are becoming more positive in their views. Views are widespread but, in general, it seems that time allocations are acceptable.

Summary

In general, the students see the value of writing skills and the place of Arabic for further study. However, the courses seem to have too much literature and they consider that the courses do not encourage further reading. Their views of grammar are not clear but improve with age. The role of examinations in learning is unclear while the amount of time given to Arabic studies seems about right. Overall, the students' views about aspects of their studies in Arabic are positive.

(2) Think about your school studies in English language

(a) Learning English is essential in today's world

Gender	Groups	sa	a	n	d	sd	Compare	χ^2	df	sig
All	4th	86	12	1	1	0				
All	3rd	74	19	3	0	4	3rd and 4th years	7.2	1	0.01
Girls	4th	85	12	2	2	0	girls 4th and 3rd	3.8	1	0.05
Girls	3rd	74	19	5	0	3	boys 4th and 3rd	cannot	be calculated	
Boy	4th	93	7	0	0	0	3rd boys and girls	2.4	2	n.s
Boy	3rd	74	20	0	2	4	4th boys and girls	cannot	be calculated	

Table 7.10 Question 2 (a)

In general, all groups agree with the statement. Although the fourth year boys seem the most positive in their views, it is impossible to calculate chi-square because so many of the frequencies are so small. Nonetheless, all groups see that learning English is essential in today's world and this grows with age. Does this reflect a view of learning which sees subjects in terms of their usefulness or is it simply being realistic?

(b) The most important skill is being able to speak English

Gender	Groups	sa	a	n	d	sd	Compare	χ^2	df	sig
All	4th	69	26	2	2	1				
All	3rd	61	31	4	3	1	3rd and 4th years	2.0	2	n.s
Girls	4th	68	27	3	3	1	girls 4th and 3rd	0.2	1	n.s
Girls	3rd	65	28	5	3	0	boys 4th and 3rd	2.8	1	n.s
Boy	4th	76	24	0	0	0	3rd boys and girls	0.7	1	n.s
Boy	3rd	57	35	4	2	2	4th boys and girls	0.8	1	n.s

Table 7.11 Question 2 (b)

All groups show agreement with the statement, this being more marked with age. Again, the emphasis is on one major aspect of communication.

(c) Reading English is essential for those involved in science and teaching.

Gender	Groups	sa	a	n	d	sd	Compare	χ^2	df	sig
All	4th	56	30	11	2	2				
All	3rd	55	31	11	3	1	3rd and 4th years	0.0	2	n.s
Girls	4th	56	31	10	2	2	girls 4th and 3rd	0.8	2	n.s
Girls	3rd	49	34	12	5	0	boys 4th and 3rd	0.3	1	n.s
Boy	4th	62	24	14	0	0	3rd boys and girls	2.2	1	n.s
Boy	3rd	63	27	8	0	2	4th boys and girls	0.3	1	n.s

Table 7.12 Question 2 (c)

This table show that all groups towards strongly agree with the statement although the question is ambiguous: there are two areas: science and teaching.

(d) Learning English should be started at a very young age										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	78	18	3	0	1				
All	3rd	83	11	5	1	0	3rd and 4th years	1.3	1	n.s
Girls	4th	79	18	3	0	1	girls 4th and 3rd	1.0	1	n.s
Girls	3rd	85	9	5	2	0	boys 4th and 3rd	0.3	1	n.s
Boy	4th	76	21	0	3	0	3rd boys and girls	0.2	1	n.s
Boy	3rd	82	12	6	0	0	4th boys and girls	0.1	1	n.s

Table 7.13 Question 2 (d)

All groups hold similar views in seeing the importance of starting learning English at a young age. This is consistent with the evidence that very early learning of second language brings huge benefits.

(e) English Language is helpful in many activities when I leave school										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	52	31	12	2	2				
All	3rd	48	31	13	5	3	3rd and 4th years	2.6	3	n.s
Girls	4th	53	29	14	3	2	girls 4th and 3rd	1.1	2	n.s
Girls	3rd	54	23	14	8	2	boys 4th and 3rd	0.4	1	n.s
Boy	4th	48	52	0	0	0	3rd boys and girls	4.1	2	n.s
Boy	3rd	41	41	12	2	4	4th boys and girls	0.2	1	n.s

Table 7.14 Question 2 (e)

It is clear that a large proportion see the value of English language in many activities beyond school.

(f) English textbooks are not helpful										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	22	24	21	23	10				
All	3rd	28	25	27	10	10	3rd and 4th years	10.0	4	0.05
Girls	4th	24	24	21	22	10	girls 4th and 3rd	4.4	3	n.s
Girls	3rd	23	28	29	8	12	boys 4th and 3rd	5.5	2	n.s
Boy	4th	10	24	24	31	10	3rd boys and girls	1.9	3	n.s
Boy	3rd	35	22	25	12	6	4th boys and girls	1.7	1	n.s

Table 7.15 Question 2 (f)

Views are spread widely although there is tendency more towards agreeing with the statement. If the value of English lies in communication, then textbooks may not be the best way forward.

(g) English language will help me in my future career										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	58	29	10	1	3				
All	3rd	58	25	13	3	2	3rd and 4th years	1.3	2	n.s
Girls	4th	56	30	11	1	3	girls 4th and 3rd	0.3	2	n.s
Girls	3rd	60	26	12	0	2	boys 4th and 3rd	1.5	1	n.s
Boy	4th	69	24	3	0	3	3rd boys and girls	1.5	2	n.s
Boy	3rd	55	22	14	6	2	4th boys and girls	1.7	1	n.s

Table 7.16 Question 2 (g)

There is no significant difference between any of the groups. Again, it is encouraging to see that all groups value English language for future careers.

(h) My school has proper audiovisuals aids for learning English										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	9	15	22	18	35				
All	3rd	9	9	18	17	48	3rd and 4th years	6.8	4	n.s
Girls	4th	7	12	24	19	39	girls 4th and 3rd	2.3	3	n.s
Girls	3rd	11	12	15	20	42	boys 4th and 3rd	cannot be calculated		
Boy	4th	7	17	10	38	28	3rd boys and girls	2.9	2	n.s
Boy	3rd	6	4	20	12	57	4th boys and girls	30.3	1	0.001

Table 7.17 Question 2 (h)

In general, the perception is of lack of proper visual aids. The sample of fourth year boys is very low and their responses probably reflect the schools involved. Of course, there is the question about the place of audio-visual materials for second language acquisition.

(i) Most of the time we talk Arabic during the English lessons										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	29	40	8	21	9				
All	3rd	38	32	10	14	7	3rd and 4th years	10.9	3	0.01
Girls	4th	22	41	7	23	8	girls 4th and 3rd	9.8	2	0.01
Girls	3rd	42	34	6	14	5	boys 4th and 3rd	1.5	3	n.s
Boy	4th	21	31	21	14	14	3rd boys and girls	2.2	1	n.s
Boy	3rd	33	29	14	14	10	4th boys and girls	1.4	1	n.s

Table 7.18 Question 2 (i)

A wide variety of experiences is noted in all groups but the younger groups state that they speak English more. The reason for this is that, in the past few years, many private new schools have been opened, offering extra classes in English. In these schools, it is not allowed for the Arabic language to be spoken during English classes.

Summary

Overall, students views are very positive about the place of English in their studies. They want to start learning English when very young and they clearly see the place of English as a key to careers, further study and in the areas of science and teaching. The importance of speaking is very marked while the textbooks are not regarded so well. In many classes, clearly the teaching is by using the English language but there seems to be a lack of audio-visual materials but these may not be an essential part of language learning.

(3) Think about your school studies in Science subjects (biology, chemistry and physics).

(a) Science is too dominated by western thought										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	χ^2	**df**	**sig**
All	4th	21	25	33	17	4				
All	3rd	40	28	20	8	4	3rd and 4th years	18.0	4	0.001
Girls	4th	19	25	34	18	5	girls 4th and 3rd	15.4	3	0.01
Girls	3rd	43	20	22	9	6	boys 4th and 3rd	2.0	2	n.s
Boy	4th	31	28	28	10	3	3rd boys and girls	4.9	2	n.s
Boy	3rd	35	39	18	6	2	4th boys and girls	2.2	1	n.s

Table 7.19 Question 3 (a)

The general view is that science is too dominated by Western thought although this becomes less marked with age, the movement being most marked for the girls. Perhaps, as they become older, the begin to appreciate more the dominance of western input into scientific discovery and developments. There is an element of inevitability in science being seen as Western in that most of the major developments in the sciences have come from research in Europe and the US. Many Arabic speaking countries have only developed universal education systems in the past fifty years and, only in this period of time, have the sciences been taught in any systematic way.

(b) My studies have helped me to make sense of the world around										
Gender	**Groups**	**sa**	**a**	**n**	**d**	**sd**	**Compare**	χ^2	**df**	**sig**
All	4th	58	37	4	1	0				
All	3rd	46	34	7	2	1	3rd and 4th years	1.9	3	n.s
Girls	4th	61	34	4	2	0	girls 4th and 3rd	0.6	1	n.s
Girls	3rd	55	39	6	0	0	boys 4th and 3rd	3.7	1	0.05
Boy	4th	35	59	7	0	0	3rd boys and girls	0.0	1	n.s
Boy	3rd	57	29	8	4	2	4th boys and girls	7.3	1	0.01

Table 7.20 Question 3 (b)

In general, all groups are positive with this statement. For girls, the general trend is for more agreement with age although this is not significant. With the boys, the effect is in the opposite direction. In both cases, the movement is to 'strongly agree'. The result is that the fourth year groups differ by gender. Clearly, the fourth year boys are less strongly convinced that their studies in science are helping them make sense of the world around but the difference is small. This is a matter of concern.

(c) Learning science successfully depends too much on have a good memory										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	49	36	12	3	0				
All	3rd	61	28	4	6	2	3rd and 4th years	4.1	2	n.s
Girls	4th	51	36	11	3	0	girls 4th and 3rd	0.8	2	n.s
Girls	3rd	57	31	3	6	3	boys 4th and 3rd	5.5	1	0.05
Boy	4th	38	38	24	0	0	3rd boys and girls	0.8	1	n.s
Boy	3rd	65	25	4	6	0	4th boys and girls	1.6	1	n.s.

Table 7.21 Question 3 (c)

Both boys and girls groups appear to change to increasing agreement with age but the effect is not significant. However, sadly, with all groups, they all think that science is a memory dependent subject. This must reflect the way the subjects are being taught and assessed.

(d) My textbooks were not easy to understand										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	18	28	18	28	8				
All	3rd	45	27	13	11	4	3rd and 4th years	32.1	3	0.001
Girls	4th	18	27	17	31	9	girls 4th and 3rd	26.4	3	0.001
Girls	3rd	46	28	12	11	3	boys 4th and 3rd	2.8	2	n.s
Boy	4th	24	35	28	10	3	3rd boys and girls	0.3	3	n.s
Boy	3rd	43	27	14	12	4	4th boys and girls	2.0	2	n.s

Table 7.22 Question 3 (d)

In general, textbooks do not receive a universally positive view with regard to understanding although things improve with age. It seems to be true for both boys and girls, although with the boys it cannot be shown statistically.

(e) Science is often far too difficult										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	22	36	14	21	7				
All	3rd	40	40	10	6	4	3rd and 4th years	21.7	3	0.001
Girls	4th	23	34	15	23	7	girls 4th and 3rd	22.1	2	0.001
Girls	3rd	46	40	11	3	0	boys 4th and 3rd	1.4	2	n.s
Boy	4th	21	52	7	14	7	3rd boys and girls	3.6	2	n.s
Boy	3rd	33	41	8	10	8	4th boys and girls	2.6	1	n.s

Table 7.23 Question 3 (e)

All groups see science as difficult, this being consistent with many other studies (e.g. Johnstone, 1991). Things generally become a little easier with the older groups although, even here, the majority still see the subjects as difficult. This is a major problem with subjects like the sciences which are highly conceptual (Johnstone, 1997).

(f) Much of my science study was unrelated to life										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	10	15	15	34	26				
All	3rd	15	18	28	21	18	3rd and 4th years	15.1	4	0.01
Girls	4th	10	15	15	33	27	girls 4th and 3rd	9.6	3	0.05
Girls	3rd	12	19	29	23	17	boys 4th and 3rd	2.7	1	n.s
Boy	4th	10	14	17	38	21	3rd boys and girls	0.7	3	n.s
Boy	3rd	18	18	27	18	18	4th boys and girls	0.0	1	n.s

Table 7.24 Question 3 (f)

In general, there is a widespread range of views with more seeing science study as related to life than the reverse. The relationship grows with age. It has been suggested that this is one key in making the sciences more attractive and accessible (see Reid, 1999, 2000)

(g) The curriculum of science does not suit me										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	9	13	18	28	31				
All	3rd	12	7	22	29	30	3rd and 4th years	4.0	3	n.s
Girls	4th	10	12	17	27	35	girls 4th and 3rd	0.7	3	n.s
Girls	3rd	11	9	17	31	31	boys 4th and 3rd	0.5	2	n.s
Boy	4th	3	21	28	41	7	3rd boys and girls	1.1	3	n.s
Boy	3rd	14	4	27	27	29	4th boys and girls	2.4	1	n.s

Table 7.25 Question 3 (g)

In general, there is more 'disagreement' than 'agreement' although there is a wide range of view. Reid and Skryabina (2002) did find clear evidence that three factors were important: the physics curriculum, the physics teacher and the perceived rewards in terms of careers.

(h) It would help me get a good job in the future										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	36	31	23	8	2				
All	3rd	48	32	15	4	1	3rd and 4th years	7.4	2	0.05
Girls	4th	38	29	23	8	3	girls 4th and 3rd	4.0	2	n.s
Girls	3rd	46	34	17	3	0	boys 4th and 3rd	1.9	1	n.s
Boy	4th	21	45	24	10	0	3rd boys and girls	0.4	2	n.s
Boy	3rd	51	29	12	6	2	4th boys and girls	0.0	1	n.s

Table 7.26 Question 3 (h)

While all groups see the studies in the sciences as being helpful for jobs, the trend is for fewer to hold this view with age. This is probably because they need to study medicine or engineering at university and to get good jobs with future careers. However, the Libyan education system does not allow students to change from sciences to arts and so on. There is inbuilt inflexibility.

(i) Studying science can make our lives healthier										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	49	39	7	4	1				
All	3rd	51	27	17	4	1	3rd and 4th years	8.4	2	0.05
Girls	4th	51	37	7	4	2	girls 4th and 3rd	2.4	2	n.s
Girls	3rd	52	29	15	2	2	boys 4th and 3rd	1.6	1	n.s
Boy	4th	35	55	10	0	0	3rd boys and girls	1.5	2	n.s
Boy	3rd	49	25	14	8	0	4th boys and girls	2.8	1	n.s

Table 7.27 Question 3 (i)

With all groups, there is tendency for increasing agreement with age although this involves a reduction in those holding neutral positions and an increase in those who 'agree'. However, the most important observation is that the vast majority agree with the question: perhaps medical advances derived from the sciences dominate this view?

(j) A good thing about learning science is the fact that everything is so clear-cut, either right or wrong										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	14	32	33	15	6				
All	3rd	23	24	37	13	4	3rd and 4th years	6.5	3	n.s
Girls	4th	13	33	32	16	7	girls 4th and 3rd	4.8	3	n.s.
Girls	3rd	12	26	46	14	2	boys 4th and 3rd	2.2	2	n.s
Boy	4th	21	24	41	10	3	3rd boys and girls	5.8	2	n.s.
Boy	3rd	37	20	25	12	6	4th boys and girls	1.7	2	n.s

Table 7.28 Question 3 (j)

Overall, the tendency is for agreement rather than disagreement although the neutral position attracts many. However, overall, they seem to see science in fairly 'black and white' terms.

Summary

The students are very aware of the role of the sciences in careers and the impact of the science in enriching lifestyles, possibly in terms of medical advances. The course seems to help in making sense of the world around and the curriculum is fairly positively received, with its relevance for life being appreciated a bit. However, the students are aware of the dominance of Western thought and tend to see the sciences in 'right-wrong' terms. In general, the sciences are seen as difficult and too memory dependent while the textbooks do not receive too much approval.

The responses suggest that there are some important issues to be addressed in Libya: the sciences need to be more related to life (see Skryabina, 2000; Reid, 1999, 2000) and the whole question of curriculum construction needs to be re-considered. Two monographs relating to chemistry and physics were published recently (Mbajiorgu and Reid, 2006 a,b) and these seek to bring together the findings from science education research to pinpoint the key features of curriculum design in these two subjects which evidence indicates are of great importance. These would offer a starting point for a renewed curriculum.

The issue of the place of memorisation is also important. Science can be seen as a body of facts or it can be seen as a way of exploring the world and asking questions. Studies by Reid and Serumola (2006, 2007) have shown that there is limited achievement with younger students (aged 12-15) in understanding the way science works. This study looked at a European country and an African country and the patterns tended to be similar, suggesting a developmental issue: the students were, perhaps, simply not old enough in developmental terms to see the place of the experiment as a way to test and develop hypotheses. Very recent unpublished work by Al-Ahmadi (2007) found similar ignorance with senior school students in an Arabic-speaking country.

This is an issue which needs further exploration. The sciences are not only subjects with a considerable conceptual basis but they are also subjects where the approach to enquiry is a key feature of the nature of these disciplines. Educating in the sciences must address these issues. It was interesting to note that, in the Alhmadi study, one experiment was conducted in Scotland and there appeared to be a very mature grasp of the nature of scientific enquiry with a small group of students aged 17-18, all of whom had passed at least one Higher Grade examination (the examination which gains university entry) in a science subject. This suggests that achieving the aim of giving students an understanding of the way science works *is* possible, given the right curriculum and teaching approach. However, her sample was small.

(4) Think about your school studies in Mathematics.

(a) I find mathematics to be very useful in daily life										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	39	37	5	14	5				
All	3rd	31	40	10	7	12	3rd and 4th years	12.8	4	0.05
Girls	4th	40	35	6	15	6	girls 4th and 3rd	2.9	2	n.s
Girls	3rd	34	46	8	8	5	boys 4th and 3rd	0.6	1	n.s
Boy	4th	35	55	3	7	0	3rd boys and girls	5.9	1	0.05
Boy	3rd	27	33	12	6	22	4th boys and girls	0.3	1	n.s

Table 7.29 Question 4 (a)

It is encouraging that the majority of pupils agree with the statement. The third year boys do appear to hold somewhat different views but, because of the low numbers, this cannot always be shown by means of chi-square. Looking at the year groups together, views become slightly more positive with age.

Mathematics is only needed by those studying subjects like the sciences										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	14	30	23	25	8				
All	3rd	15	22	32	15	17	3rd and 4th years	13.1	4	0.01
Girls	4th	14	28	22	27	9	girls 4th and 3rd	7.3	3	0.05
Girls	3rd	14	19	34	19	15	boys 4th and 3rd	1.9	2	n.s
Boy	4th	14	41	31	14	0	3rd boys and girls	1.4	3	n.s
Boy	3rd	16	27	29	10	18	4th boys and girls	1.8	1	n.s

Table 7.30 Question 4 (b)

Views are widespread. Clearly, many see mathematics as more than a service subject for subjects like the sciences. There are differences between the third and fourth year groups but the patterns of moves are not too clear cut although there is a drop in those 'strongly disagreeing' with age.

Some pupils can 'do' mathematics, others cannot 'do' mathematics										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	50	39	6	2	4				
All	3rd	56	35	4	3	3	3rd and 4th years	1.4	2	n.s
Girls	4th	50	40	4	2	5	girls 4th and 3rd	0.6	1	n.s
Girls	3rd	57	34	2	3	5	boys 4th and 3rd	1.5	1	n.s
Boy	4th	48	35	17	0	0	3rd boys and girls	0.0	1	n.s
Boy	3rd	57	35	4	4	0	4th boys and girls	0.3	1	n.s

Table 7.31 Question 4 (c)

The most interesting observation is the extent to which all the pupils agree with the statement. This may reflect reality but it is still sad. It suggest that almost all see some students as simply incapable of making much progress in mathematics.

(d) Mathematics tends to be too abstract										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	16	22	25	25	11				
All	3rd	19	29	27	11	13	3rd and 4th years	9.5	4	0.05
Girls	4th	18	21	26	25	12	girls 4th and 3rd	2.3	2	n.s
Girls	3rd	12	32	29	14	12	boys 4th and 3rd	2.4	2	n.s
Boy	4th	7	31	24	28	10	3rd boys and girls	4.8	3	n.s
Boy	3rd	29	25	25	8	14	4th boys and girls	0.0	2	n.s

Table 7.32 Question 4 (d)

There is a wide range of views, with many more disagreeing as they become older. In very rough terms, the proportion showing disagreement is approximately the same as those showing agreement at the older age.

(e) I find mathematics easy										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	15	20	18	24	24				
All	3rd	11	25	17	18	30	3rd and 4th years	4.2	4	n.s
Girls	4th	17	19	17	24	25	girls 4th and 3rd	7.3	3	0.05
Girls	3rd	11	34	19	14	23	boys 4th and 3rd	3.2	2	n.s
Boy	4th	3	24	28	28	17	3rd boys and girls	8.2	2	0.05
Boy	3rd	10	12	14	25	39	4th boys and girls	0.7	1	n.s

Table 7.33 Question 4 (e)

Views are spread widely although disagreement is chosen more than agreement. There are some small differences between the subgroups, the older girls being slightly less positive with age. The younger group of boys is less positive than the equivalent girls group. However, the patterns reflect diverse views although the difficulties with mathematics are showing clearly.

(f) Mathematics is definitely my subject										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	13	4	7	31	46				
All	3rd	16	10	6	18	50	3rd and 4th years	7.9	3	0.05
Girls	4th	14	4	6	30	47	girls 4th and 3rd	5.7	3	n.s
Girls	3rd	25	9	5	23	39	boys 4th and 3rd	1.4	2	n.s.
Boy	4th	3	3	14	38	41	3rd boys and girls	5.6	1	0.05
Boy	3rd	4	10	8	12	65	4th boys and girls	0.8	2	n.s.

Table 7.34 Question 4 (f)

Overall, only a minority see mathematics as their subject. Sadly, the older group tends to be less positive than the younger group. The responses show considerable polarisation, again reflecting the fact that there are those who 'love' mathematics' and those who do not. Interestingly, the boys are much less positive.

(g) My mathematics class was more interesting than other subjects										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	χ^2	**df**	**sig**
All	4th	15	24	17	27	18				
All	3rd	32	15	17	13	24	3rd and 4th years	20.1	4	0.001
Girls	4th	18	25	15	24	20	girls 4th and 3rd	10.3	3	0.01
Girls	3rd	35	22	11	9	17	boys 4th and 3rd	2.5	2	n.s
Boy	4th	0	17	28	48	7	3rd boys and girls	7.1	2	0.05
Boy	3rd	27	6	18	16	33	4th boys and girls	7.0	1	0.01

Table 7.35 Question 4 (g)

As might be expected, views are widely scattered although the strong positive and negative views tend to become less strong with age. For the girls, the older group shows much less positive views towards mathematics with age while the boys show a similar trend

(h) Mathematics is not preparing me well for further study										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	χ^2	**df**	**sig**
All	4th	12	16	28	26	18				
All	3rd	18	12	30	21	18	3rd and 4th years	3.6	4	n.s
Girls	4th	13	16	28	26	18	girls 4th and 3rd	1.0	3	n.s
Girls	3rd	11	12	32	26	19	boys 4th and 3rd	4.8	3	n.s
Boy	4th	7	14	28	31	21	3rd boys and girls	4.2	2	n.s
Boy	3rd	29	12	27	14	18	4th boys and girls	1.0	2	n.s.

Table 7.36 Question 4 (h)

There is a wide spectrum of views and, although there appear to be differences between groups, none is significant.

Summary

The views relating to mathematics show considerable diversity. They see mathematics as the subject for some but definitely not for others. Indeed, the polarisation of views is quite marked. However, they do see mathematics as useful and as a preparation for life and not entirely the province of being a service subject for the sciences. However, mathematics is not easy although they do not see it as over abstract. Some find it more interesting than other subjects, others hold the reverse views.

Mathematics does appear to be a problem area in the curriculum. No educational system can afford to have such significant minorities being 'turned off' by a subject. The subject is known to be difficult. Nonetheless, the curriculum and the way it is taught needs to be re-examined in the light of what is known from research evidence.

(5) Think about the way you were tested in school tests and examinations.

(a) There is too much emphasis on memory skills										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	37	37	12	12	3				
All	3rd	47	35	11	5	2	3rd and 4th years	2.0	2	n.s
Girls	4th	38	38	11	12	3	girls 4th and 3rd	2.8	2	n.s
Girls	3rd	49	31	11	8	2	boys 4th and 3rd	3.4	2	n.s
Boy	4th	35	31	17	14	3	3rd boys and girls	1.3	2	n.s
Boy	3rd	43	41	12	2	2	4th boys and girls	1.2	2	n.s

Table 7.37 Question 5 (a)

The most interesting observation is the extent to which all the pupils agree with the statement (see Harter and Pike 1984, pp. 1969-1982). It reflects a rejection of a system where the rewards from examinations come largely from the recall of memorised information and suggests the need for a major overhaul of assessment nationally.

(b) Examinations and test results made me feel a failure										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	20	32	9	25	14				
All	3rd	42	18	18	10	11	3rd and 4th years	33.1	4	0.001
Girls	4th	21	31	9	24	16	girls 4th and 3rd	21.5	3	0.001
Girls	3rd	43	17	19	11	11	boys 4th and 3rd	1.9	2	n.s
Boy	4th	14	38	14	31	3	3rd boys and girls	0.3	3	n.s
Boy	3rd	41	20	18	8	12	4th boys and girls	0.0	1	n.s

Table 7.38 Question 5 (b)

The general trend is for a movement towards 'disagree' with age although it is only possible to show that this is significant for the girls. However, it is say to note the proportion of all groups (mostly over 50%) who agree with the statement, suggesting a rather bad effect of assessment.

(c) I like the way examinations were organised										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	75	22	2	1	0				
All	3rd	68	22	6	3	1	3rd and 4th years	1.5	1	n.s
Girls	4th	75	23	2	1	0	girls 4th and 3rd	1.3	1	n.s
Girls	3rd	82	15	2	2	0	boys 4th and 3rd	4.3	1	0.05
Boy	4th	76	17	3	3	0	3rd boys and girls	12.0	1	0.001
Boy	3rd	51	31	12	4	2	4th boys and girls	0.0	1	n.s.

Table 7.39 Question 5 (c)

The third year boys show a different pattern of responses, being less positive in their attitudes. Otherwise the majority of pupils like the way examinations are organised.

(d) Tests and examinations in Arabic seem unrelated to the real use the language										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	18	15	28	25	14				
All	3rd	31	19	31	8	11	3rd and 4th years	14.8	3	0.01
Girls	4th	18	15	28	24	16	girls 4th and 3rd	14.6	3	0.01
Girls	3rd	32	19	34	6	9	boys 4th and 3rd	0.6	3	n.s
Boy	4th	21	21	31	28	0	3rd boys and girls	1.9	3	n.s
Boy	3rd	29	20	27	10	14	4th boys and girls	1.7	2	n.s

Table 7.40 Question 5 (d)

With all groups, the views are spread quite widely although strongly disagree is not so common. There seems to be a change with both boys and girls with age but only for the girls is this showing a significant value of chi-square. The older groups are less positive.

(e) Tests in the sciences involved little more than recalling facts										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	7	24	38	20	11				
All	3rd	19	20	28	18	15	3rd and 4th years	13.3	4	0.01
Girls	4th	9	23	37	21	12	girls 4th and 3rd	2.7	3	n.s
Girls	3rd	14	23	28	25	11	boys 4th and 3rd	4.2	2	n.s
Boy	4th	0	28	52	14	7	3rd boys and girls	4.2	3	n.s
Boy	3rd	27	16	29	8	20	4th boys and girls	2.7	2	n.s.

Table 7.41 Question 5 (e)

Views are spread widely. Overall, there is a slight change to increasing disagreement with age. The sciences can be seen as bodies of facts or as approaches to gain understanding of the world around. There is perhaps a greater need to emphasise the latter.

(f) I think that the examinations system affects the development of my skills										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	25	21	20	23	11				
All	3rd	28	21	20	14	17	3rd and 4th years	5.1	4	n.s
Girls	4th	28	21	10	22	11	girls 4th and 3rd	5.1	4	n.s
Girls	3rd	23	25	19	14	20	boys 4th and 3rd	3.1	2	n.s
Boy	4th	10	21	28	31	10	3rd boys and girls	3.0	3	n.s
Boy	3rd	35	16	22	14	12	4th boys and girls	3.2	2	n.s

Table 7.42 Question 5 (f)

There are few trends which are obvious but there is a slightly greater tendency to agreement with the statement, perhaps reflecting an awareness of how examinations control learning.

(g) The quality of the curriculum is vital to encourage students to stay at school										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	59	28	6	6	2				
All	3rd	48	25	9	8	10	3rd and 4th years	9.6	3	0.05
Girls	4th	61	25	7	6	2	girls 4th and 3rd	6.3	2	0.05
Girls	3rd	48	25	5	11	12	boys 4th and 3rd	0.4	1	n.s
Boy	4th	41	52	3	3	0	3rd boys and girls	0.2	2	n.s
Boy	3rd	49	27	14	4	6	4th boys and girls	4.0	1	0.05

Table 7.43 Question 5 (g)

There is strong agreement with the statement. This is totally consistent with findings of Reid and Skryabina (2002) who found clear evidence of the power of the curriculum in attracting students into Physics. Their work is also consistent with the much earlier findings of Hadden and Johnstone (1983) when they looked at the sciences in general along with geography, and mathematics.

(h) I like the examinations in mathematics because they gave me scope to show my understanding										
Gender	**Groups**	**sa**	a	**n**	**d**	**sd**	**Compare**	**χ^2**	**df**	**sig**
All	4th	26	33	12	12	17				
All	3rd	24	28	22	11	16	3rd and 4th years	5.6	4	n.s
Girls	4th	28	32	11	12	18	girls 4th and 3rd	8.0	3	0.05
Girls	3rd	32	35	19	6	8	boys 4th and 3rd	5.4	2	n.s
Boy	4th	14	41	24	14	7	3rd boys and girls	17.2	2	0.001
Boy	3rd	12	18	27	16	27	4th boys and girls	0.2	1	n.s

Table 7.44 Question 5 (h)

Views are spread widely. Although not clear cut statistically, girls appear to be more in favour of having this scope for understanding than boys. This may simply reflect the fact that boys and girls are educated separately and that there is a tendency for the teachers at girls schools to give more emphasis and commitment.

Summary

While examinations are seen as well organised, they tend to see them being too dependent on memory and, for some, they produce feelings of failure. Their views of examinations in Arabic seem to improve with age while there are widespread views about the place of memory in the sciences, the views not being too positive. Their views of mathematics examinations tend to be positive. They are not completely convinced that examinations enhance the development of their skills but they are very clearly aware of the power of the curriculum to attract in terms of staying on at school.

Question (6) Imagine you are the adviser to a government minister in charge of secondary school education. He asks you for the three best features of current Libyan education and the three worst features:
List these, using one sentence to describe each.

Unfortunately, when translated into Arabic, the question implied that students were being asked to indicate the features they *would like* best rather than the current best features. Their responses must be interpreted in the light of this: they express what they wish to happen.

The responses of the students were considered in detail and found to contain a wide range of responses. They were then grouped under a number of headings and are presented below as frequencies, showing only those ideas where at least 10 students were involved:

(a) The three best features

	Summary of Comments (N = 343)	N
1	Strong preference for two semester year.	30
2	Develop the curriculum, focussing more on the important subjects like Mathematics and English language.	28
3	School laboratories should have more facilities and equipment for Biology, Chemistry, Physics.	28
4	Schools laboratories should be equipped with computer laptops from basic to high education.	27
5	Teachers should be trained and qualified in their subjects.	27
6	Schools should be equipped with new computer rooms provided with internet access.	26
7	The school must organise school trips through the year such as visiting factories, science laboratories.	24
8	The number of the taught subjects should be reduced and the focus should be more on practical aspects.	23
9	English language and Information Technology from the start of basic education (age 6).	22
10	The examination system must change and focus more on the subject matter studied.	21
11	Create a well organised examination system and set dates for the examinations,	18
12	Provide the school library with extra resources, materials and equipment.	16
13	Motivate and reward the students who have high grades in the school.	15
14	School must have enough teachers before the start of each academic year.	14
15	The school must choose qualified and experienced teachers by putting them through training.	13
16	The school should care more about the sports facilities like finding out more places for leisure activities.	11

Table 7.45 Best Features Desired

Discussion

Looking at the list of their key issues, five general areas of concern are apparent. These are listed in table 7.46. In looking at resources, four areas relate directly to the formal curriculum. It is clear that, in the eyes of the students, the very rapid growth in the education system has not been matched by the resource levels. Of course, the growth in the equipment and facilities related to computers has been enormous and schools in all countries have difficulty in keeping up. The resource problem has been identified in specific areas in several other previous questions.

The problem of teacher supply is apparent, with teachers being asked to teach outside their specialisms and there being shortages from time to time. This reveals, from the

student perspective, the folly of asking teachers to move outside their own areas of competence and confidence and is consistent with many other studies (e.g. Harlen and Holroyd, 1997, who look at primary school science and observed very low levels of confidence). This lack of competence and confidence clearly has made a significant impact on the students in Libya.

In the curriculum, they focus very greatly on English and mathematics and they see the learning of English as needing to start at a very young age. It is possible that the advent of the internet has made it very clear to these Arabic speaking students that English is now vitally important for progress in many areas of study and many textbooks and resources are only available in the English language, especially in the sciences.

Looking at assessment, two questions (10,11) address a major problem in the Libyan system where examinations dates are often not known in advance and where the examination papers often test outside the syllabus taught. With so much depending on examination results, it is essential that the system is fair and seen to be fair.

They also have two organisational requests, with the need for the two semester year have the highest frequency. This is related to testing in that everything depends on the end of year assessments. Having a two term year, with end of semester testing, would be a great advantage. Interestingly, the two semester year has since been introduced.

Students were asked to give reasons for their choices and the range of reasons was very large. Table 7.47 merely offers one typical reason for each suggestion, this reason being seen on several survey forms. The reasons offered are to be seen as typical rather than definitive.

	Best Features	Typical Reasons Given
1	Strong preference for two semester year.	Shorter study focus time with examinations at end of each semester
2	Develop the curriculum, focussing more on the important subjects like Mathematics and English language.	These subjects are basics for getting on and making progress in other areas.
3	School laboratories should have more facilities and equipment for Biology, Chemistry, Physics.	More facilities would give better learning
4	Schools laboratories should be equipped with computer laptops from basic to high education.	To aid understanding and make the science subjects more clear
5	Teachers should be trained and qualified in their subjects.	Teachers can offer more encouragement and give confidence to the students
6	Schools should be equipped with new computer rooms provided with internet access.	To help people to know more about the world around
7	The school must organise school trips through the year such as visiting factories, science laboratories.	To give more opportunity for students to know new things which give more information
8	The number of the taught subjects should be reduced and the focus should be more on practical aspects.	To allow more focus on what is really important and related to life
9	English language and Information Technology from the start of basic education (age 5).	They felt that students would make most progress if they started their studies as early as possible
10	The examination system must change and focus more on the subject matter studied.	This gives focus to their studies as well as being fair
11	Create a well organised examination system and set dates for the examinations,	They want to know when examinations will take place so that they can prepare properly.
12	Provide the school library with extra resources, materials and equipment.	To give students opportunity for much more reading and to help them for their studying
13	Motivate and reward the students who have high grades in the school.	To encourage them and give more care for them
14	School must have enough teachers before the start of each academic year.	So that everything is organised in advance and time is not wasted at the start
15	The school must choose qualified and experienced teachers by putting them through training.	To enable meaningful teaching, covering the syllabus very well.
16	The school should care more about the sports facilities like finding out more places for leisure activities.	For more student activities

Table 7.47 Some Typical Reasons

Discussion

Looking at the list of their key issues, the reasons can be linked to the five general areas of concern. Of course, the reasons shown in table 7.47 are typical rather than definitive and it is not easy to summarise the large variety of reasons into simple categories. In general, the students have offered arguments which make sense. They can see simple ways by which their school experience might be enhanced and, in a country of great wealth, many of 0these could be implemented easily. The teacher training and supply problem is not so easy but, perhaps the way ahead is to enhance the status of teachers and, therefore, attract more highly qualified entrants.

Question (6) Imagine you are the adviser to a government minister in charge of secondary school education. He asks you for the three best features of current Libyan education and the three worst features.
List these, using one sentence to describe each.

(b) The three worst features

	Summary of Comments	N
1	Students do not have a freedom to choose their subject direction	19
2	Little support for student welfare	17
3	School subjects have too much theory and not enough which is practical and related to life	15
4	The teachers do not finish the curriculum within the specified time period	15
5	Regulation of schools some times is not suitable for students	15
6	There is not enough time to complete the practical parts of the curriculum	14
7	There is not enough modern equipment and facilities, specially science library at school.	14
8	There is a shortage of qualified teachers who can teach science and English.	14
9	There is a lack of control in the phenomena of exam cheating which is increasing from year to year.	14
10	There are some problems in the way teachers treat students.	13
11	Teacher absences result in non-completion of the syllabus before the end of year.	13
12	Some teachers are not creative in delivering their subject to students.	13
13	Some teachers favour some students more than others.	13
14	Some syllabuses are not relevant to their course of studies in their school	12
15	There is no encouragement for students when they face problems at school	12
16	There is not enough attention to students' needs and problems.	12
17	Studying and learning IT and English language starts too late in the school.	12
18	Sometimes examination questions are excessively difficult and are not related to what students are studying.	12
19	Classrooms are too small and are often overcrowded.	12
20	The developing habit of smoking with teenagers.	11
21	Lack of care and responsibilities in following up in school regulation and rules.	11
22	Students are depending on teachers (too much 'spoon feeding' and not enough independent thought)	10
23	Schools frequently lack key essential items.	10

Table 7.49 Worst Features

Discussion

Looking at the list of their key issues, the same five general areas of concern are apparent.

In looking at the curriculum, three of the features (3,6,14) relate to the way the curriculum is not seen as related to life or is practical. Of course, the practical element might simply refer to the desire for more practical activities like laboratory work. However, it does seem that the students wish to see what they are doing being more related to the wider world around or even the nature and purposes of their school courses.

Thinking of the teachers, it is natural for school students to be critical! However, while some of their suggestions are simply related to teacher shortages and an overcrowded curriculum, there is the hint that they wish more open types of lessons, with less

dependence on lecture type knowledge transmission. The need for IT and English to be started earlier is also apparent. Clearly, lack of resources is also identified.

There are two comments related to assessment. There is some resentment when examinations are simply not related to what is taught although, perhaps, many students might wish for easier examinations! However, cheating does seem to be an issue - an observer can often see students taking in notes and using them!

Looking at organisation, one theme seems to stand out. There seems to be a felt need for what might be called pastoral care although this might also relate to aspects of discipline. In this, the identification of smoking specifically is interesting if sad. Nonetheless, these comments do suggest, overall, the need for the education system to put in place some kind of pastoral support structure.

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Again, the reasons offered are to be seen as typical rather than definitive.

	Worst Features	Typical Reasons Given
1	Students do not have a freedom to choose their subject direction	This has major effects on future studies and work possibilities.
2	Little support for student welfare at school	Students want some guidance to encourage them
3	School subjects have too much theory and not enough which is practical and related to life	It hinders understanding and fails to give opportunities to relate things to the reality of practical life.
4	The teachers do not finish the curriculum within the specified time period	Teacher absences and examinations cover topics not taught
5	Regulation of schools sometimes is not suitable for students	Students sometimes feel they are treated badly without due reasons being offered.
6	There is no enough time to complete the practical parts of the syllables	Teachers not starting on time and over-emphasis on theoretical parts of the syllabus.
7	There is not enough modern equipment and facilities, specially science library at school.	This is very important for students to understand and assist in good studying.
8	There is a shortage of qualified teachers who can teach science and English.	In some subjects, teachers are concentrated in the High Schools, leaving middle schools inadequately staffed.
9	There is too much cheating at the end of year examinations	Examination pressures in society encourage cheating.
10	There are some problems in the way teachers treat students.	They feel that teachers are sometimes over-harsh and unfair.
11	Teacher absences result in non-completion of the syllabus before the end of year.	This can cause students to fail examinations
12	Some teachers are not creative in delivering their subject to students.	This is often because the teachers are being asked to teach subjects which are not their own.
13	Some teachers favour some students more than others.	This is most unfair for students and sometimes, students feel very bad about it.
14	Some syllabuses are not relevant to their course of studies	Teachers often add extra material which is not necessary
15	There is no encouragement for students sometimes to say what their needs are	By listening to students, things can be altered and improved.
16	There is not enough attention to students' needs and problems.	Students do have problems from time to time and these are important to help learning to be effective.
17	Studying and learning IT and English language starts too late in the school.	The earlier the better for understanding and progress
18	Sometimes examination questions are excessively difficult and are not related to what students are studying.	This can produce failure and students drop out of school or want to give up.
19	Classrooms is are too small and are often overcrowded.	There is not enough time for teachers to check the work of all students.
20	The developing habit to smoking with teenagers.	Sometimes, there is lack of control from parents and school system to stop this.
21	Lack of care and responsibilities in following up in school regulation and rules.	Sometimes the schools do not seem to care and there is a lack of control and regulation
22	Students are depending on teachers (too much 'spoon feeding' and not enough independent thought)	The examination system and ways of success encourage teachers to teach this way.
23	Schools frequently lack key essential items.	This affects learning and may cause students to leave school or move to another school.

Table 7.51 Some Typical Reasons

Discussion

Looking at the list of their key issues, the reasons can be linked to the five general areas of concern. Of course, the reasons shown in table 7.51 are typical rather than definitive and it is not easy to summarise the large variety of reasons. Nonetheless, the reasons illustrate the thinking process of the students: they are thinking carefully.

Question (7) In three sentences, write down what you consider to be the most important reasons which will help students to work hard until they complete their secondary education.

	Summary of Comments	N
1	Students often cannot get the subject direction they wish and this hinders commitment to work	36
2	Students need to aim at getting a high performance by focussing on work clearly	19
3	Having good connections between students, parents and teachers	18
4	Focussing on studying and reading all subjects over the year to pass exams.	18
5	Students need to be helped so that they divide their time properly between subjects areas.	17
6	Students need to know plans and syllabuses for subjects	16
7	Monthly tests would aid studying.	16
8	Teachers need to be helped to teach more clearly, using visual aids where appropriate	15
9	There needs to be enough teachers so that class sizes are lower	15
10	Student welfare is neglected: too much travel to and from school and lack of support	15
11	There needs to be enough teachers so that class sizes are lower	14
12	Students need to see that good education can allow them to be more effective in society on leaving school	14
13	Hard work is controlled by the need to get what we need in the next stage of study	13
14	Students need more support for study in English	13
15	When subjects are enjoyed with good teachers, students work hard	13
16	Difficulties can be overcome with family support	12
17	When students have high aspirations, hard work follows	12
18	Problems arise when students do not work at home, with parental encouragement	12
19	Some families have more knowledge and experience of good opportunities and can encourage more	12
20	Schools need regular parents meetings	11
21	Students need to see the possibilities for future careers and this encourages good study	11
22	Students would appreciate a doctor or psychologist in the school	10
23	Good relationship between the students and teachers to support students to have good attitudes	10
24	Syllabuses need to be covered clearly with well qualifiified teachers	10

Table 7.53 Some Reasons

Discussion

Students were asked to identify reasons for working hard. It is significant that seven of the comments relate to issues of support: support at home, support by teachers, home-school links. This relates to the expressed need for pastoral support in a previous question (table 7.49). The powerful influence of teachers is again apparent and shortages are seen to be important. The students seem to see the need for what might be called study skills and time organisation while a major influence in encouraging hard work is clearly seeing where it all leads: when a student has a clear picture of the next stages, then it makes hard work worth while. This also emphasises the need to have a curriculum which is perceived as relevant and related to the lifestyles and aspirations of the learners.

Question (8) Imagine you are living in the year 2020. In what ways will secondary education in Libya have to change to meet the needs of the future?
*Describe these in no more than three sentence*s.

This question was analysed by looking at all the statements made by the students. Categories of statements were then developed and each statement was placed in a category. This was not easy as some comments were not easy to place with certainty and a few could not be placed at all. Nonetheless, many ideas seemed to occur again and again and the most frequent ones are listed in table 7.55.

	Summary of Comments	**%**
1	The curriculum needs to be in depth and have the latest developments.	20
2	When society is developed the organisation is going to be developed.	20
3	Keep updating with the later technology from different places and try to learn and implement.	19
4	Avoid the traditional education and apply the new learning tools	19
5	Use different skills to encourage students to enjoy their learning	18
6	Resources such as internet, libraries, English language centre, etc... to enhance the learning process	17
7	Implement the e-learning concept in the education system.	17
8	Non-complicated curricula will lead to a decrease in the time period of education	16
9	Have educated teachers holding higher degrees such as masters and PhD's to teach in secondary schools	16
10	Find different ways to develop the level of education.	15
11	Plenty of good school buildings to accommodate the high number of students	15
12	Better teacher preparation so that teaching is more efficient	14
13	Teaching English and IT in nursery will be advanced	14
14	More focusing on students activities and skills	13
15	Things will be more clear and understandable than at the current time.	13
16	Students will have less interest in education	13
17	Students will miss the use good of technology	12
18	Concentrate in teaching physics and chemistry and relate it to real life.	12
19	Direct the student who cannot continue in the school education to vocational education	11
20	Government will value and support education better	11
21	Education level will compete with the developed countries education systems.	10
22	Schools will accommodate all the types of specialisation together.	10

Table 7.55 The Future of Education

Discussion

This asks the students to project themselves forward, perhaps to a time when they themselves will have teenage children. It is not easy to create categories of responses; indeed, some responses are not completely clear.

Nonetheless, some issues do relate to the curriculum for 2020. These range from the very broad (1,8,13) to very specific ideas: the teaching of English and IT at nursery levels (13), both of which are supported by research evidence (Birdsong, 1999; Razali 2007); the suggestion that all schools will offer all specialisations (22), thus avoiding disappointment when students fail to gain access to the specialisation of their choice or have to travel too far. There is an important comment about physics and chemistry, the suggestion of

relating these to real life being consistent with other evidence (e.g.. Reid and Skryabina, 2002a,b). The students also see issues relating to resource levels and to the way education is seen in a societal context and related to that operating in the developed world.

Overall, while there is evidence of rather vague thinking, there are nonetheless ideas which would be worthy of consideration and exploration by educational planners in Libya. Far too often, educational planning takes place with little regard for the views of the students and here students nearing the end of their studies were offered a free response to issues for the future.

7.5 Conclusions

The aim of this survey was to allow students nearing the end of their studies at secondary school to reflect on their experiences and to offer ideas for the future, indicating what they saw as good and bad from their perspective. Of course, theirs is not the only important voice. The needs and wishes of society and, specifically, of parents must also be considered while the experience of teachers is vital in planning for the future. In considering the results, it has to recognised that the gender balance (77% girls) was very poor, due to difficulties in accessing schools. Results must, therefore be interpreted with caution.

Four major curriculum areas (Arabic, English, Sciences, Mathematics) were considered. In Arabic in general, the students see the value of writing skills and the place of Arabic for further study. Their views of grammar are not clear but improve with age. The role of examinations in learning is unclear while the amount of time given to Arabic studies seems about right.

It is clear that English is seen as important; students views are very positive about the place of English in their studies. They want to start learning English when very young and they clearly see the place of English as a key to careers, further study and in the areas of science and teaching. The importance of speaking is very marked while the textbooks are not regarded so well. In many classes, clearly the teaching is by using the English language but there seems to be a lack of audio-visual materials but these may not be an essential part of language learning.

In the sciences, students are very aware of the role of these subjects in terms of careers and the impact of the sciences in enriching lifestyles, possibly in terms of medical advances. They tend to see the sciences as 'right-wrong' and their studies are seen as too memory orientated. Some key issues are identified. They wish to see the subjects as more related to life. Probably because of the way the examinations are set in terms of recall, science is seen as a body of facts but perhaps they wish it to be seen more as a way of exploring the world and asking questions. In general, the sciences are seen as difficult and too memory dependent while the textbooks do not receive too much approval.

Mathematics also comes out badly but it is seen as important and relevant. The views relating to mathematics show considerable diversity. They see mathematics as the subject for some but definitely not for others. Indeed, the polarisation of views is quite marked. However, they do see mathematics as useful and as a preparation for life and not entirely the province of being a service subject for the sciences. However, mathematics is not easy although they do not see it as overly abstract. Some find it more interesting than other subjects, others hold the reverse view. Overall, compared to other areas they either like it or hate it.

In looking at the examination system, there is too much memory dependence. There is a fear of failure almost certainly because failing to reach specified standards closes opportunities for the future. Examinations seem to have the power to force students to work, but they want less emphasis on end-of-year assessment. Their views of examinations in Arabic seem to improve with age while there are widespread views about the place of memory in the sciences, the views not being too positive. On the other hand, their views of mathematics examinations tend to be positive. They are not completely convinced that examinations enhance the development of their skills but they are very clearly aware of the power of the curriculum to attract in terms of staying on at school.

Many other general observations can be made.

(a) Resource levels are inadequate: everything from class sizes, equipment, libraries, computers.

(b) Teachers: the students are remarkably perceptive here. They appreciate that good teachers must know their subject and be confident and enthusiastic in it. While some of their suggestions are simply related to teacher shortages and an overcrowded curriculum, there is the hint that they wish more open types of lessons, with less

dependence on lecture type knowledge transmission. They note the problems of teacher supply, with teachers being asked to teach outside their + and there being shortages from time to time. This reveals, from the student perspective, the folly of asking teachers to move outside their own areas of competence and confidence

(c) English: English is very important, especially in relation to the internet and sciences. They argue for a much earlier start to English, even at nursery levels. English is now vitally important for progress in many areas of study and many textbooks and resources are often only available in the English language, especially in the sciences.

(d) Examination problems: there is the problem in the Libyan system where examination dates are often not known in advance and where the examination papers often test outside the syllabus taught. With so much depending on examination results, it is essential that the system is fair and seen to be fair. Cheating is identified as a problem and needs to be addressed.

(e) Organisation: everything depends on the end of year assessments and they argue for two semester years, thus reducing the impact of end-of-year assessments in determining their future progress. Interestingly, the two semester year has since been introduced

(f) The curriculum: they wish this to be related to life; related to their needs and future needs; a related to the lifestyles and aspirations of the learners.

(g) Practical work: while it is not completely clear how they conceive practical work, they ask for more. In looking at the curriculum, this request might relate to the way the curriculum is not seen as related to life or it might simply refer to the desire for more practical activities like laboratory work.

(h) Teaching Approaches: They seem to want less lecture type teaching, less crowded curriculum so that they can complete all that is required on time.

(i) Pastoral Care: there seems to be a repeated emphasis on the need for this, involving teachers as well as home and school-home links. There is a genuine concern over aspects of discipline, with the growth of smoking being identified. Overall, these comments do suggest the need for some kind of pastoral support structure, to be put in place, with appropriate discipline structures.

(j) Specific issues relating to physics and chemistry: The students are aware of the dominance of Western thought and also tend to see the sciences in 'right-wrong' terms but some specific comments about these subjects are offered. In life beyond school, these subjects often offer the key to major career areas, including all the basic

sciences, medicine and engineering. Perhaps, their comments might be seen in terms of a growing awareness that the way these subjects are offered at school is very inadequate.

Chapter Eight

Third Survey

8.1 Introduction

The first survey of this research was designed to offer some kind of overview of students attitudes towards studying in school in Libya, towards their main curriculum subjects and towards their future careers. The emphasis was on how these attitudes developed from age 12-20.

While the overall picture was fairly positive, there seems to be an expressed wish for freedom: freedom to question, freedom to express themselves, freedom to be released from the dominance of memorisation and recall. The system is highly didactic and teacher-centred. The dominance of the sciences and technologies was noted while the polarisation of views relating to mathematics stood out. Clearly, Libya has gone through, and is still going through, a social revolution in terms of educational opportunities, especially with regard to girls.

In the second survey, students towards the end of secondary schooling were able to look back at their educational journey as well as look forward to the next stages of higher education or employment. Some key strengths and weaknesses of the provision in four major subjects areas (Arabic, English, mathematics and the sciences) were noted. The students also pinpointed areas where they wished change or improvement, these relating to resource issues, provision and training of teacher issues, curriculum issues, with strong criticisms of the assessment and examination systems as well as expressed wish for what might be called pastoral support

One of the features of the Libyan system is the way in which subject direction is fixed at later stages of education (around 15+). Here, the students have to opt for arts, the sciences or technology and, once the decision is taken, it cannot be changed later, these subject directions being taught in separate schools. Students, therefore, may be committed to an area of study which, later, they find is not what they want. Some fail to enter their preferred areas of study. Some leave, others continue on without enthusiasm. The survey described in this chapter focusses on the age group when these decisions have just been taken. The starting point was to look at first year in high school to see how they have perceived their new stage in their school.

8.2 Sampling and Method of Analysis

The students were drawn from a wide range of schools reflecting three different types of schools (for arts, sciences, technology). The samples were chosen to be typical of the population of students at these stages in Libyan high schools. 737 students aged 16-17 were drawn from twelve high schools in their first secondary year (see Table 8.1).

Specialism	Boys	Girls	Total
Sciences	221	196	417
Arts	18	166	184
Technology	45	91	136
Totals	**284**	**453**	**737**

Table 8.1 Boys and Girls aged 16-17

Table 8.1 reflects the typical proportions of those who have opted for the three subject areas. Table 8.2 shows the sample of school pupils participating in the research showing how 12 schools were involved.

Number of Pupils from each year of study in 2005/2006					
Schools	**Gender**	**Sciences**	**Arts**	**Technology**	**Total**
1	girls	85			85
2	girls	69			69
3	girls		85		85
4	girls		81		81
5	girls			91	91
6	girls	42			42
7	boys	27			27
8	boys		18		18
9	boys	91			91
10	boys	103			103
11	boys			23	23
12	boys			22	22
Totals		**417**	**184**	**136**	**737**
Percentage		**57%**	**25%**	**18%**	**100%**

Table 8.2 Sample by School and Specialisms

The questionnaire is shown in full and then each question is discussed in detail. As before, all data are shown as percentages for clarity while all statistical calculations use frequencies. The survey questionnaire contained questions in a variety of styles and is shown fully in the appendix.

8.3 The Questionnaire

Your Name: ..... Boy ☐ Girl ☐

Your School:.....

Course Chosen (*tick one box*): ☐ Arts-based ☐ Science-based ☐ Technology-based

Subjects being studied at the moment (*list all the subjects you are studying this year*):

(1) You will like some subjects better than others.

(a) What is your favourite subject: .....
(b) What is your second favourite subject: .....
(c) What subject do you like least ? .....
(d) Thinking of your favourite subject, explain why you like it best:.

(2) Thinking of the course you are now studying, here are some reasons for choosing that course. Tick all the reasons that are true for you:

☐ I do not like science subjects
☐ Mathematics is my best subject
☐ I like learning languages
☐ My teacher encouraged me
☐ I think my course will lead to good jobs
☐ These subjects are the ones where I gain the best marks
☐ I am doing what parents encouraged me to do
☐ I like doing practical things
☐ The subjects are important for study at university for my chosen career.
☐ I think my course will help me to understand the world.
☐ I find the sciences too difficult

(3) Question about learning style
(Tick one box on each line)

(a)	I prefer to learn by reading books.	☐	☐	☐	☐	☐
(b)	I have a good memory.	☐	☐	☐	☐	☐
(c)	I llike to understand things rather than simply memorise them.	☐	☐	☐	☐	☐
(d)	I like subjects where things are clearly right or wrong.	☐	☐	☐	☐	☐
(e)	I find I rely heavily on clear explanations from the teacher.	☐	☐	☐	☐	☐
(f)	I learn best when I do things for myself.	☐	☐	☐	☐	☐
(g)	I like doing subjects which involve calculations.	☐	☐	☐	☐	☐
(h)	I often see ideas in terms of mental pictures.	☐	☐	☐	☐	☐
(I)	I am sure I shall pass my examinations	☐	☐	☐	☐	☐

(4) Think of your middle school experience
(Tick one box on each line)

I enjoyed it	☐☐☐☐☐☐	I hated it
It was too easy	☐☐☐☐☐☐	It was too difficult
It helped me to think of possible careers	☐☐☐☐☐☐	I still do not have a clear career direction
There was not enough time in science	☐☐☐☐☐☐	There was too much time in science
I did well in my exams	☐☐☐☐☐☐	I did badly in my exams
My best marks came in arts subjects	☐☐☐☐☐☐	My worst marks came in arts subjects

(5) Think your life as whole.
Please tick three which you think are most important.

- ☐ My abilities
- ☐ My academic achievement
- ☐ My popularity
- ☐ Expertise
- ☐ My attractiveness
- ☐ My sporting skill
- ☐ My willingness to take risk
- ☐ My sociability
- ☐ My creative ability
- ☐ My independent mind

(6) Imagine your are faced with a new and demanding type of problem in your studies.
What is your likely reaction?
Tick ***as many*** as you which.

(a)	Worry about passing the examinations	☐
(b)	See it as a challenge	☐
(c)	Start to panic	☐
(d)	Seek help for	☐
(e)	I have managed in the past- I'll managed now	☐
(f)	Think of changing my course	☐
(g)	Enjoy it because it is new	☐
(h)	Seek help from others	☐

(7) What made you choose?
You have now chosen your course (sciences, arts, or technology)
In no more than three sentences, say why you made your choice.

The questionnaire asks straightforward questions and it was made clear to the students that their answers would not affect their results in any way or be seen by their teachers. Responses were anonymous. In this way, it is hoped that the responses do reflect the actual situation and how the students really think. Nonetheless, in discussing the results, it has to be noted that the responses may not be an exact picture of the attitudes of the students. Thus, conclusions drawn must be interpreted with some caution.

8.4 Data Analysis

The opening questions were not numbered and were designed to allow the students to respond with factual information.

Subjects Studied	%
Arabic Language	100
English Language	100
Computer	100
Islamic Studies	89
Mathematics	86
Physics	62
Chemistry	51
Biology	51
Economic	39
Law	25
Management	39
Statistics	39
Business	25
Computer Programming	11
Basic Computer	11
History	14
Geography	14
Sociology	14
Psychology	14
Philosophy	14

Table 8.3 Subjects Studied

Three subjects (Arabic language, English language, and computer science, shown in red) are compulsory for all students at all high school levels (Sciences, Arts or Technology). The very high numbers taking courses in Islamic Studies, Mathematics and the Sciences can be noted (green). The first is influenced, perhaps, by the dominant role of Islam in Libyan society while the other four arose because of job opportunities. Courses which relate to the world of business (brown) are also popular but the more traditional arts and social subjects (blue) are taken by very few.

The proportions can be compared to Scotland, a more traditional western curriculum, with students of a similar age group. The list alongside shows *only* the subjects where there is common identification across the two systems. The low uptake in second language in Scotland and greater uptakes in social subjects, with smaller numbers opting for the sciences can easily be seen .

Question 1

(1) You will like some subjects better than others.

(a) What is your favourite subject: .....
(b) What is your second favourite subject: .....
(c) What subject do you like least ? .....
(d) Thinking of your favourite subject, explain why you like it best:

	First Choice	Second Choice	First + Second	Least Favourite
Arabic	50	59	109	71
English	136	91	227	90
Mathematics	88	66	154	147
Biology	150	86	236	12
Chemistry	52	69	121	37
Physics	18	39	57	121
Computing	4	21	25	15
Computer Programming	43	38	81	35
Islamic Studies	51	69	120	6
History	7	5	12	0
Geography	0	2	2	0
Economics	36	47	83	0
Psychology	9	13	22	6
Sociology	7	7	14	7
Law	16	13	29	32
Management	20	28	48	19
Statistics	61	71	132	0
Philosophy	37	17	54	15

Table 8.5 Favourite and least Favourite Subjects

Looking at the first plus second favourite choice column, it is interesting to note the attractiveness of the two main languages, biology and chemistry, as well as mathematics and statistics; Islamic Studies also rates very highly. Of course, the languages, mathematics and Islamic Studies are offered in all three types of schools. The extraordinarily high ratings for biology and English stand out. Biology is, perhaps, the perfect applications-led type of subject (see Reid, 1999, 2000; Reid and Skryabina, 2000) in that much is related to the human body while English is seen as the key to success in many subject areas in that the world literature for mathematics and the sciences is dominated by English language texts.

As a science, physics stands out as much less popular - indeed, it is highly unpopular, This was noted in earlier work from Hamed (2005) where the physics curriculum is abstract, demanding and perceived as unrelated to life and applications. The polarisation of views relating to mathematics (and also with Arabic and English) is very evident. The mathematics curriculum is clearly in need of major review. A comparison with Scotland is interesting in that mathematics shows high popularity at the upper stages of secondary education (Reid and Whitehead, 2002). This suggests that it is not the mathematics itself which is the problem but the way it is presented.

The final part of the question was open-ended and asked about the reasons why they like their favourite subject best. Their responses were grouped under a number of headings as shown in table 8.4.

Reasons	%
Enjoyment	76
Interest	75
Teacher	31
Marks	14
Understand	10
Careers	4

Table 8.6 Reasons for Favourite Choices

In looking at the table above, the top two reflect curriculum quality (enjoy, interest) while the influence of the teacher is also apparent; access (in terms of marks) and being able to understand the subject are also showing. These results, which apply to a wide range of subjects, are very similar to those obtained by Hadden and Johnstone (1982) over 25 years ago in relation to the sciences at ages 12-14 in Scotland and the data obtained by Reid and Skryabina (2002) when looking very specifically at physics. It is clear that the key factors which make subjects attractive relate to what is taught (the curriculum) and how it is taught (the teacher). The impact of influences outside the school are marginal.

Question 2

(2) Thinking of the course you are now studying.
Here are some reasons for choosing that course.
Tick all the reasons that are true for you:

%	
20	I do not like science subjects
26	Mathematics is my best subject
58	I like learning languages
43	My teacher encouraged me
80	I think my course will lead to good jobs
55	These subjects are the ones where I gain the best marks
59	I am doing what parents encouraged me to do
51	I like doing practical things
45	The subjects are important for study at university for my chosen career.
77	I think my course will help me to understand the world.
31	I find the sciences too difficult

Two reasons stand out: the students see school subjects as leading to good jobs and they also want to understand the world around. The first is understandable in that, for most students, they will move out into a world and have to find some suitable and satisfying employment. However, the strong emphasis on understanding the world around is totally consistent with the findings of Piaget (see Piaget and conceptual development, 1970) with much younger children and is also very consistent with the findings of Skryabina (2000) with respect, specifically, to physics. The natural inclination of learners is to try to make sense of things and to try to use their knowledge and understanding to make sense of the world around. This supports the idea of an 'applications-led' curriculum (see Reid, 1999, 2000).

Looking at questions 1 and 2 together, it is clear that a subject becomes a favourite due to the curriculum and the way it is taught. However, the students *select* subjects for career and study reasons along with their perception of the subject being able to help them make sense of their world.

Question 3

(3) Question about learning style

(Tick one box on each line)		SA	A	N	D	SD
(a)	I prefer to learn by reading books.	25	35	20	12	7
(b)	I have a good memory.	31	41	22	4	2
(c)	I like to understand things rather than simply memorise them.	57	24	10	7	2
(d)	I like subjects where things are clearly right or wrong.	27	24	23	15	10
(e)	I find I rely heavily on clear explanations from the teacher.	60	27	7	3	2
(f)	I learn best when I do things for myself.	48	26	14	6	5
(g)	I like doing subjects which involve calculations.	19	24	21	17	18
(h)	I often see ideas in terms of mental pictures.	26	37	26	7	3
(i)	I am sure I shall pass my examinations	46	28	22	2	1

It is clear that the students have a strong interest in gaining clear, good explanations and rely on their teachers a for this. A very marked feature is also their desire to understand rather than memorise. This is all consistent with the ideas of Piaget (see Piaget and conceptual development, 1970) when he emphasises that the learner is seeking to make sense of the world around. It seems that a natural human characteristics is to desire to understand. While learners are capable of very large amounts of memorisation, understanding seems to be favoured.

Perhaps as expected, there is a general desire to learn things on their own. This may simply reflect that the student are in adolescence (aged around 16+). They also have examination confidence. These students have just started secondary school and have made some achievements in their previous schools and this may have contributed to their confidence.

There is a wide range of views when it comes to calculations, their understanding of answers being right and wrong and the importance of books for them. The first of these may simply reflect a wide range of abilities and interest in mathematics. The second is related to the work of Perry (1999) with university students. He described younger students as holding rather 'black and white' views: knowledge was seen as right or wrong. However, as students progressed through their degrees, their views changed to be more flexible. Later work showed that students do not always progress in this simple way in their thinking (e.g. Al-Shibli, 2003; El-Sawaf, 2007).

While the students seem to think they have good memories, this may simply reflect their ability to pass examinations so far. However, of greater interest are the responses to the question about mental pictures. There is some evidence that thinking in pictures is more important and helpful while academic education often is presented in terms of words or symbols (Hindal, 2007).

Question 4

(4) Think of your middle school experience
(Tick one box on each line)

I enjoyed it	64	27	4	1	3	I hated it
It was too easy	30	43	16	5	4	It was too difficult
It helped me to think of possible careers	34	26	21	5	3	I still do not have a clear career direction
There was not enough time in science	19	29	23	14	11	There was too much time in science
I did well in my exams	45	37	11	4	3	I did badly in my exams
My best marks came in arts subjects	36	29	17	9	8	My worst marks came in arts subjects

This questions invites the students to look back to their middle school experiences. Overall, students perceptions are positive: they seemed to have enjoyed middle school. Of interest is the view that they tend to see middle school as too easy. This is an interesting observation and is consistent with some other observations (e.g. in Scotland, Reid and Whitehead, 2002). There seems to be a pattern in the success of primary schools (up to age about 12) in being able to challenge learners appropriately. It seems that the education provision from about age 12 to 14 is the problem area. Part of this may simply reflect the age of the learners as they move into adolescence. However, there does seem a problem in school curriculum at ages 12 onwards building onto the achievements made at primary stages.

At primary stages, one teacher teaches most of the curriculum, allowing the teacher to know pupils' abilities very clearly. With the separation into subject areas with specialist teachers, the curriculum does not follow on well. Even in Scotland, where there is a curriculum model which spans the age range from 5 to 14 (5-14 Curriculum, 2001), the problem is still not resolved (see Reid and Whitehead, 2002). It is likely that the problem does not rest with teachers but in the very low level of curriculum demand in use in many countries. The reason why the problem cannot rest with teachers can be seen in the fact that, in Scotland, the same teachers teach at this level and for the following four years. The following four years show very positive attitudes and performance as measured by the examinations and various surveys (see Scottish Qualifications Authority, online; Reid and Skryabina, 2002a). Thus, either the curriculum, or the way the curriculum is organised, needs to be re-thought.

Question 5

(5) Think of your life as whole.
Tick the three which you think are most important for you.

%	
50	My abilities
16	My academic achievement
23	My popularity
26	My expertise
20	My attractiveness
23	My sporting skill
42	My willingness to take risks
10	My sociability
32	My creative ability
60	My independent mind

Table 8.7 Outcomes, Question 5 (Libya)

The aim of this question was to find out how students feel towards their life as whole in terms of things which are most important. Three areas stand out: independent mind, abilities and willingness to take risks. The first is perhaps a reverse aspect of what was observed previously when students indicated they wanted less emphasis on memorisation. The students are recognising that they have minds of their own, they want to think things through for themselves and, perhaps want less imposition of ideas and emphasis on the recall of rote learned information. This is consistent with interest in taking risks. They are conscious that they have abilities of their own, they can think for themselves and, perhaps, they want to 'play with ideas' and come to their own conclusions.

Generally, the picture offered here is quite encouraging. The students are developing appropriate self-awareness and can see through some of the less important features of life (like academic achievement, popularity, appearance, sport and social abilities) to the deeper things of being able to think things through, develop their own understand and create their own ideas. However, it is possible to interpret the responses in terms of students wanting to be set free from the imposition of ideas and the rote recall of information (see Oraif, 2007). The data obtained by Oraif (with a somewhat different sample) in Saudi Arabi can be set alongside the data obtained here (Table 8.8). The areas where percentages are similar are shown in green.

Question 6

(6) Imagine your are faced with a new and demanding type of problem in your studies. What is your likely reaction?
Tick as many as you wish

%	
59	Worry about passing the examinations
56	See it as a challenge;
16	Start to panic
53	Seek help from books
50	I have managed in the past - I'll manage now
21	Think of changing my course
42	Enjoy it because it is new;
43	Seek help from others

Table 8.9 Outcomes: question 6 (Libya)

The dominant importance of the examinations in the Libyan educational system is apparent. Passing examinations gives access to the next year of study and, eventually, access to good jobs. It seems that challenges are seen as likely to hinder such passing. Nonetheless, there is strongly positive view of seeing it as a challenge to be set alongside the very realistic view that teachers are there to provide the help, perhaps reflecting the 'spoon-fed' nature of the learning situation. Overall, the reactions of the students are more or less what might be expected (see Oraif, 2007). Table 8.10 shows the Libyan and Saudi Arabian data (from Oraif, 2007) side by side. However, it has to be noted that the sample with Oraif contained both senior school pupils *and* first year university students.

Libya	Saudi	(%)
59	51	Worry about passing the examinations
56	38	See it as a challenge;
16	51	Start to panic
53	33	Seek help from books
50	51	I have managed in the past - I'll manage now
21	11	Think of changing my course
42	37	Enjoy it because it is new;
43	59	Seek help from others

Table 8.10 Outcomes, question 6 (Libya and Saudi Arabia)

In some categories, the percentages from the two countries are similar and these are shown in green: worrying, coping confidence based on past experiences, enjoyment. However, in several areas (shown in dull red), the two populations behave differently. It is interesting to note that the Libyan group are more open to challenge and less likely to panic. They tend to depend more on books and less on others.

Question 7

(7) You have now chosen your course (science, arts, or technology)
*In no more than three sentences, say **why** you made your choice.*

The responses of the students were studied and there were clear patterns of responses. These were grouped under a series of headings and listed below:

%	Reasons Offered
9	Academic success
65	Enjoyment
69	Interest
3	Teacher
52	Career
14	Parents
5	Friends
21	Useful for life
6	Challenge

Table 8.11 Outcomes: question 7

Three types of responses stand out very markedly. The main influences in making choices relate to interest, enjoyment and careers, again consistent with the outcomes from question 1(d). However, the influence of teachers is strangely low. Perhaps this is because the question looks at broad study directions (science, arts, or technology) rather than specific subjects. Perhaps, it is because they are answering the question *after* they have moved school and their current teachers are irrelevant to the decision.

It is again noteworthy to see how influences outside the school have minimal impact, confirming previous studies in other countries (e.g. Hadden and Johnstone, 1982; Reid and Skryabina, 2002)

With subject choice, gender may be important and this is discussed next.

8.5 Gender Analyses

Subject choices often reflect gender differences. This section looks at some of the questions and considers any differences between the genders in their responses. The use of chi-square for this is discussed in the appendix.

(2) Thinking of the course you are now studying.
Here are some reasons for choosing that course.
Tick all the reasons that are true for you:

Question 2					
	Boys %	**Girls %**	**Chi**	**df**	**p**
I do not like science subjects	21	19	0.6	1	n.s.
Mathematics is my best subject	26	25	0.0	1	n.s.
I like learning languages	62	55	3.6	1	n.s.
My teacher encouraged me	55	35	28.0	1	0.001
I think my course will lead to good jobs	86	76	12.0	1	n.s.
These subjects are the ones where I gain the best marks	60	51	5.3	1	0.05
I am doing what parents encouraged me to do	65	47	21.1	1	0.001
I like doing practical things	58	46	9.8	1	0.01
The subjects are important for study at university for my chosen	49	42	3.5	1	n.s.
I think my course will help me to understand the world.	79	75	1.1	1	n.s.
I find the sciences too difficult	36	27	6.5	1	0.05
Total (Average number of 'ticks' per student)	**6**	**5**			

Table 8.12 Outcomes by Gender, Question 2

As can be seen in the table above, in five of the results of the question parts of question 2, boys and girls show similar views. Where there are differences, these are shown in this and the other questions colour: green where $p < 0.001$; blue where $p < 0.01$; and brown where $p < 0.05$.

Boys say that they are encouraged from their parents and their teacher mores than girls. The boys also seems to be slightly more influenced by marks in choosing their subject direction.

As expected, boys consider that practical aspects are more important and boys say that they find the sciences more difficult.

Question 3

(3) Learning Style

Question 3			%							
			SA	**A**	**N**	**D**	**SD**	**Chi**	**df**	**p**
a	I prefer to learn by reading books	*boys*	24	38	22	11	6	2.0	4	n.s
		girls	26	34	19	12	7			
b	I have a good memory	*boys*	30	40	25	3	3	3.6	3	n.s
		girls	31	41	20	6	3			
c	I like to understand things rather than simply memorise them	*boys*	53	26	12	7	1	3.8	3	n.s.
		girls	58	23	9	6	5			
d	I like subjects where things are clearly right or wrong	*boys*	33	26	24	10	8	**21.6**	**4**	**0.001**
		girls	23	23	22	19	13			
e	I find I rely heavily on clear explanations from the teacher.	*boys*	62	26	7	4	1	1.3	3	n.s
		girls	59	26	9	3	3			
f	I learn best when I do things for myself.	*boys*	44	27	17	7	6	4.3	3	n.s
		girls	50	26	12	8	4			
g	I like doing subjects which involve calculations.	*boys*	18	24	25	15	18	5.4	4	n.s
		girls	20	23	19	19	18			
h	I often see ideas in terms of mental pictures.	*boys*	23	41	24	8	5	**19.4**	**4**	**0.001**
		girls	29	28	30	9	4			
i	I am sure I shall pass my examinations	*boys*	53	28	15	2	1	**13.5**	**3**	**0.01**
		girls	42	28	25	2	2			

Table 8.13 Outcomes by Gender , Question 3

In six of the question parts of question 3, boys and girls show similar views. Boys tend to like subjects which are clearly right or wrong (part (d)) more than the girls. The girls seem more open and flexible with regard to knowledge. Part (h) considers the use of mental pictures but the difference here is largely a move between 'strong agree' and 'agree'. Boys are, as expected, more confident that they will pass examinations (part (i)).

Question 4

(4) Think of your middle school experience
(Tick one box on each line)

I enjoyed it	64	27	4	1	3	I hated it
It was too easy	30	43	16	5	4	It was too difficult
It helped me to think of possible careers	34	26	21	5	3	I still do not have a clear career direction
There was not enough time in science	19	29	23	14	11	There was too much time in science
I did well in my exams	45	37	11	4	3	I did badly in my exams
My best marks came in arts subjects	36	29	17	9	8	My worst marks came in arts subjects

Question 4										
			%					**Chi**	**df**	**p**
a	I enjoyed it	*boys*	55	34	6	2	3	19.3	3	0.001
		girls	69	22	3	3	3			
b	It was too easy	*boys*	25	45	21	6	3	15.9	3	0.001
		girls	34	42	12	6	6			
c	It helped me to think of possible career	*boys*	50	39	4	5	2	9.8	2	0.01
		girls	38	30	22	5	5			
d	There was not enough time in science	*boys*	16	28	23	19	13	8.8	4	n.s.
		girls	22	31	22	13	12			
e	I did well in my exams	*boys*	40	39	12	4	6	7.7	3	0.05
		girls	48	36	10	3	3			
f	My best marks came in arts subjects	*boys*	30	28	17	14	11	18.9	4	0.001
		girls	41	29	17	6	7			

Table 8.14 Outcomes by Gender, Question 4

In five of the six parts, the boys and girls respond differently. In four questions, the views of girls tend more to the left:

Thus, girls find middle school experience:

(i) More enjoyable;
(ii) Easier;
(iii) Giving good marks in examinations;
(iv) Giving them best marks in arts subjects.

These response patterns may simply reflect that girls at around age 16 tend to be more mature, they work harder and are more conscientious. There is a tendency for boys to be more attracted to the sciences, especially the physical sciences and this is consistent with the girls being slightly more orientated towards the arts.

Part (c) shows the boys thinking more of careers and this simply reflects the structure and expectations of Libyan society.

Question 5

(5) Think of your life as whole.
Tick the three which you think are most important for you.

Question 5					
	boys	**girls**	**Chi**	**df**	**p**
My abilities	48	51	0.7	1	n.s.
My academic achievement	16	16	0	1	n.s.
My popularity	31	17	19.9	1	0.001
My expertise	25	26	0.1	1	n.s.
My attractiveness	16	22	4.3	1	0.05
My sporting skill	33	15	32.5	1	0.001
My willingness to take risks	42	42	0	1	n.s.
My sociability	8	12	3	1	n.s.
My creative ability	31	33	0.3	1	n.s.
My independent mind	56	62	2.4	1	n.s.

Table 8.15 Outcomes by Gender, Question 5

In thinking of their lives, boys and girls show similar preferences about what is important to them. As might be expected girls are slightly more interested in their attractiveness. However, in thinking of popularity and sporting skills, these are clearly very much more important for boys. The differences are much as might be expected.

Question 6

(6) Imagine your are faced with a new and demanding type of problem in your studies.
What is your likely reaction?
Tick as many as you wish

Question 6					
	boys %	**girls %**	**Chi**	**df**	**p**
Worry about passing the examinations	62	55	2.8	1	n.s.
See it as a challenge;	58	55	0.9	1	n.s.
Start to panic	15	16	0.1	1	n.s.
Seek help from books	67	44	35.6	1	0.001
I have managed in the past - I'll manage now	48	51	0.6	1	n.s.
Think of changing my course	23	19	1.8	1	n.s.
Enjoy it because it is new;	46	39	4.0	1	0.05
Seek help from others	54	36	22.2	1	0.001

Table 8.16 Outcomes by Gender, Question 6

In reacting to problems in their studies, boys and girls indicate that they are reacting in a similar way in five out of the eight options given to them. Boys are slightly less afraid of things which are new. The other two results are: boys are more willing to seek help from books or from others.

Question 7

(7) You have now chosen your course (science, arts, or technology)
*In no more than three sentences, say **why** you made your choice.*

Question 7					
	boys %	girls %	Chi	df	p
Academic success	11	7	2.4	1	n.s.
Enjoyment	56	71	16.2	1	0.001
Interest	65	72	3.3	1	n.s.
Teacher	4	3	0.3	1	n.s.
Career	58	48	7.0	1	0.01
Parents	10	17	7.3	1	0.01
Friends	4	6	1.0	1	n.s.
Useful for life	29	16	17.6	1	0.001
Challenge	11	3	18.6	1	0.001

Table 8.17 Outcomes by Gender, Question 7

In about half the reasons given, the percentages of boys and girls are similar. However, in only one case are the numbers large: those who regard interest as the one of the key reasons for choosing their subject direction. The last choice offered ('challenge') gives a significant value for chi-square but the calculation is doubtful because of low percentage of girls who indicated this.

In two questions, the boys show higher percentages and these relate to career or future life. Clearly, in Libya, the role of boys as 'wage-earners' is still regarded highly. In two other areas, the girls show high percentages. For the girls, subject interest holds a stronger influence on subject choice and parents also have a greater impact.

Summary of Gender Issues

For a high proportion of the questions, boys and girls respond similarly. In many areas any differences are much as might be expected. For example, girls at age 16 are much more mature than boys at the same age. They tend to be more conscientious and hardworking while boys tend to see things in more 'black and white' terms, enjoying practical aspects more and feeling more confident (perhaps over-confident?) in examinations.

However, boys are more orientated towards careers seeing, these as a more powerful influence over subject choices. Perhaps, this explains why they feel they are being encouraged (maybe, pushed) more than the girls by parents and teachers although girls do feel that parents have a powerful influence on subject choice. For girls, interest holds a more powerful influence on subject choice while, for boys, career possibilities are more dominant.

8.6 Overall Conclusions

The focus of this survey was to explore the influences which were seen as important by the students in making their subject choices. The findings of a previous survey in the middle and high schools in Libya, (Secrretariat of Education Report (Libya, 2000) suggested that the factors influencing curriculum choices related to interest, enjoyment and teacher impact. The results here show some consistency with the findings there.

The results seem to give a clear consistent picture.

(a) Students ***like*** subjects which they perceive as interesting, enjoyable and of direct relevance to their lives.
(b) Students ***choose*** subjects when they enjoy them, see them as of direct relevance to their lives and able to assist in making sense of the world around, as well as for career and job reasons.

All of this demonstrates the power of an imaginative curriculum and creative, committed teaching in attracting students towards further study. The detailed work of Skryabina (2000) in relation to Physics showed very clearly that perceived curriculum quality is to be seen in terms of the subject material being seen as of direct application to the learners at their stage of development and in the context of their lifestyles. She found that students can cope with difficult curricula if it is still seen this way. The power of the teacher in bringing the curriculum 'alive' in this way is critical although even the best teacher might have difficulty with a totally inappropriate curriculum.

In thinking of subject popularity and subject choices, the marginal relevance of influences outside the school is very marked, and is consistent with previous studies. However, parents do have some influence on subject choices.

It is interesting to note the attractiveness of languages, biology and chemistry as well as mathematics and Islamic studies. However, physics faces problem. with its abstract and demanding courses. In addition, for a sizeable number, mathematics is also unattractive.

A very marked feature is also their desire to understand rather than memorise. They want explanations. It seems that a natural human characterist is the desire to understand. While learners are capable of very large amounts of memorisation, understanding seems to be favoured. Nonetheless, the use of effective memorisation in passing examinations is recognised.

The students are recognising that they have minds of their own, they want to think things

through for themselves and, perhaps want less imposition of ideas and emphasis on the recall of rote learned information. This is consistent with interest in taking risks. They are conscious that they have abilities of their own, they can think for themselves and, perhaps, they want to 'play with ideas' and come to their own conclusions.

While they seemed to have enjoyed middle school, it is seen as too easy. Thus, either the curriculum, or the way the curriculum is organised, needs to be re-thought.

There are some differences between the responses of boys and girls but many of them are to be expected. Thus, girls at age 16 are much more mature than boys at the same age, tending to be more conscientious and hardworking while boys tend to see things in more 'black and white' terms, enjoying practical aspects more and feeling more confident in examinations.

When it comes to course choices, boys are more influenced by potential careers. In broad terms, for girls, interest holds a more powerful influence on subject choice while, for boys, career possibilities are more dominant.

8.7 Bringing the Surveys Together

The first survey was designed to offer some kind of overview of students' views about certain aspects of their school experiences, the emphasis being on looking for trends with age. The aim of the second survey was to allow students nearing the end of their studies at secondary school to reflect on their experiences and to offer ideas for the future, indicating what they saw as good and bad from their perspective. The focus of the final survey was to explore the influences which were seen as important by the students in making their subject choices. This section seeks to bring together the main findings which have been observed.

In many ways, the students are fairly positive about their school experiences and the learning approaches which are used. However, there seems to be an expressed wish for freedom. Teachers are seen as the sources of knowledge and, even in their science subjects, memorisation still holds power. All of this reflects a system where the teacher is an authority figure, often see as beyond question, and the curriculum is based tightly on prescribed textbooks and lecture type presentations.

It is clear that there has been considerable change in social structures relating to educational opportunities, with the opportunities for girls' education having grown enormously in a very short space of time. The students are well aware of the problems relating to teacher supply and teacher competence. They seem to want teachers who know their subject and are confident and enthusiastic in it. It is also clear that resources have not kept pace with the growth of the system: everything from class sizes, equipment, libraries, computers

In comparing their reactions to Arabic, the sciences and mathematics, Arabic is regarded best and there is steady decline in positive attitudes when considering most aspects of learning in mathematics. The importance of the sciences is perceived well. However, these subjects are being seen very much in terms of bodies of knowledge to be mastered or, perhaps, just memorised. Science knowledge is seen in terms of it being right or wrong. They would clearly like to see the subjects being more related to life and as a way to make sense of the world around. While large numbers choose to take courses in the sciences, mainly for career reasons, there is some evidence that not all is well in physics and there is a suggestion that both physics and chemistry should assume higher profiles, albeit with different emphases.

The views relating to mathematics show considerable diversity. Views are highly polarised, with mathematics being seen as only for some. However, they do see mathematics as useful and as a preparation for life and not entirely the province of being a service subject for the sciences. However, mathematics is not easy although they do not see it as overly abstract. Thus, mathematics does appear to be a problem area in the curriculum.

Overall, students views are very positive about the place of English in their studies but they want to start learning English when very young and they clearly see the place of English as a key to careers, further study and in the areas of science and teaching. Indeed, some envisage English starting at nursery levels, a remarkable observation.

A number of more general curriculum issues have emerged. While they wish for curricula which are related to life and lifestyles as well as related to their needs, future needs and aspirations, they also seem to be seeking for a less crowded curriculum and the opportunity for more practical work. Some students are remarkably aware that education should be seen in a societal context and, perhaps, be brought more into line with systems operating in the developed world.

Success in examinations tends to be seen as too dependent on memory and, for some, they produce feelings of failure. Overall, they still rely on the security of factual knowledge which is regarded in black and white terms. However, there are some serious problems with examinations. Timetables are not planned in advance, examinations sometimes test beyond the syllabus, there is clearly considerable cheating which is producing resentment. Given the power of the examination in the Libyan system, such concerns are understandable. The strongly expressed wish for the two semester year is probably linked to the concern over end of year examinations controlling everything. With a revised system, assessment would be more frequent and less 'final'.

There is a persistent request for what might be called pastoral care in schools. The students want support, not just in terms of developing effective and efficient work patterns but also in terms of pastoral care involving teachers, parents, and home and school-home links.

With students in Libya choosing subject directions and then going to separate schools based on these, the whole question of subject choice was explored. The results seem to give a clear consistent picture. Liking subjects depends on interest and perceived relevance while course choices are heavily influenced by career options as well as percived relevance.

All of this demonstrates the power of an imaginative curriculum and creative, committed teaching force in attracting students towards further study. The marginal relevance of influences outside the school is very marked. However, parents do have some influence on subject choices. When it comes to course choices, boys are more influenced by potential careers. In broad terms, for girls, interest holds a more powerful influence on subject choice while, for boys, career possibilities are more dominant.

A very marked feature is also their expressed desire to understand rather than memorise. They want explanations. It seems that a natural human characteristics is the desire to understand, despite the recognition that memorisation can assist in passing examinations. The students want to think things through for themselves and, perhaps want less imposition of ideas and emphasis on the recall of rote learned information.

While they seemed to have enjoyed middle school, it is seen as too easy. Education from age 12-15 seems to cause problems in many countries, curriculum adjustment usually failing to solve the problem. Part of the problem may simply lie in adolescence. However, part may lie in a lack of intellectual demand in the curricula and the way some subjects have been trivialised. Specifically, the introduction of science with one teacher has often

caused a serious trivialisation (see Mbajiorgu and Reid, 2006a, 2006b). This may illustrate what is happening in other subjects to a lesser extent.

This section has tried to bring together some of the main findings form the three surveys. The summary assumes that the responses from the students actually reflect what they think. The next stage is to take some of these issues and discuss them with a small sample of students to see if the general findings are supported by their verbally expressed views.

Chapter Nine

Fourth Survey (Interviews)

9.1 Introduction

Three surveys have been conducted using questionnaires. The first survey offered an overview of students' views, the emphasis being on looking for trends with age. The second survey allowed students nearing the end of their studies at secondary school to reflect on their experiences and to offer ideas for the future. The final survey was to explore the influences which were seen as important by the students in making their subject choices. Only boys could be interviewed for cultural reasons.

Various areas of the curriculum were explored and the whole question of subject direction and course choice was considered. The questionnaires suggested that students *like* subjects which they perceive as interesting, enjoyable and of direct relevance to their lives but students *choose* subjects when they enjoy them, see them as of direct relevance to their lives and also able to assist in making sense of the world around, as well as for career and job reasons. Subject difficulty was also considered. Two issues related to this seemed important: firstly, the Libyan system rewards recall of memorised material and student views about this and the desire to understand were, at times, not clear cut. The nature of the curriculum was surveyed, and it seems that students want a curriculum which they perceive as more related to themselves, their lifestyles and the context of their studies. Finally, mathematics was identified as a core subject with some problems, with positive attitudes tending to fall with age and very considerable polarisation of views.

Interviews offered a useful way to examine further these issues and to see to what extent what the students said matched the pictures which had come from analysing the questionnaires. An opportunity arose to interview a sample of teachers and this gave added insights in offering a new perspective on the Libyan educational provision as seen from the teacher perspective. The question was the extent to which teacher views matched student views.

The word *interviewing* covers a wide range of practices. There are tightly structured, survey interviews, with prepared, standardised, normally closed questions (chapter 5). At the other end of the continuum are open-ended, apparently unstructured interviews that might be seen almost as friendly conversations (Spradley, 1979).

Of course, the interviewing *methods* needs to be appropriate for the purposes in mind. Interviews can be used to gain general insights so that a questionnaire can be developed. Equally, interviews can be used to follow large-scale questionnaires to offer deeper insights into themes identified by the questionnaires or to offer some kind of confirmation that conclusions drawn from the questionnaire data are valid (Seidman, 1998). This is how the interviews were used here.

Interviews are very demanding of time and the analysis of outcomes can be extremely time-consuming. In this study, the interviews were very clearly set with practical purposes in mind. They aimed to give fresh insights into themes which were seen as important, after the questionnaire analyses. Thus, specific themes were identified and possible questions listed. They were also seen as an opportunity to see if the outcomes from the questionnaires were likely to be correct.

Thus, the interviews were semi-structured in that specific themes and questions were planned but there was scope for more open-ended discussion, this arising in the light of the way responses were given. Clearly, with teachers, there was greater scope of open-endedness while, with students, things were slightly more prescribed.

Helsby *et al*., (1998) suggest ways by which data from qualitative analysis can be integrate into the writing of a final report. This is an area of difficulty. The amount of data can be enormous and very diverse. It is difficult to reduce to simple conclusions. In this study, the outcomes from the questionnaires were analysed so that they related to what had been obtained from the several questionnaires. The interviews were to expand, to enrich, to exemplify, to explain. The questionnaires and the interviews, together, are to be seen as offering a picture of the situation in Libyan education.

Gillhman (2000a) summarises some key features for interviews, perhaps the focus being mainly on semi-structured interviews.

> *"(1) Questions asked, or topics raised, are 'open' with the interviewee offering their own answers. This a key distinction from questionnaires where, frequently, the researcher not only asks the questions but provides the answers in some sort of choice format*
>
> *(2) The relationship between interviewer and interviewee is responsive or interactive. This allows for clarification, exploration, expansion.*
>
> *(3) The discussion may be informal and relaxed but there is still structure and purpose on the part of the interviewer."*

Although rather obvious, Mason and Bramble (1989) define the interview as a method of data collection that involves verbal discussion conducted by one person with another primarily to obtain information. They go on to note that the goal is not so much to get answers to questions, nor to test hypotheses, and not to "evaluate" as the term is normally used. Interviews offer insights, they raise questions, they may even allow an exchange of perceptions. In addition, the interview method is generally considered flexible and easy to adapt to a variety of situations. The interviewer can probe for more information by exploring the responses and asking questions that clarify points. Thus, interviews can be powerful although very time-consuming

Seidman (1998) pointed out that an interview affirms the importance of the individual. From the researcher's perspective, interviews can be very satisfying in that key insights are obtained and there is a feeling that individuals have be listened to carefully.

Results from the interviews of why these positions are so dominant are presented in two sections: Students and teachers.

9.2 The Procedures Adopted here

The interviews took place at the middle of the academic year for Libyan schools (2006/2007) with 13 high school students aged 16-19, 6 teachers and an inspector for high schools being interviewed. In Libya, students are taught in separate schools according to their chosen specialisms and the students were selected to represent these areas, in rough proportion to the sizes of the types of schools: eight students from medical and basic science high schools, two students from economic high schools, one from an agriculture high school, one from a language high school and one from an engineering high school.

The teachers were drawn from various schools and were selected to cover six different subject specialisms, the inspector with a seventh specialism. Every attempt was made to select teachers who were typical of the different subject areas, types of school and experiences.

The interviews were not recorded but the interviewer took notes and transcribed these into neater notes immediately after each interview. The texts were then scrutinised for common phrases, ideas, suggestions and these were then summarised. The summaries are presented here, with exemplar interview notes being in the appendix.

9.3 Students Interviews

The questionnaires had explored issues relating to the choices the students made of subject areas (known as 'direction of studies' in Libya). Issues had arisen about the place of memorising and recall as well as how they saw subject relevance while mathematics seemed to be the area of the curriculum which had most problems. This defined the agenda for the student interviews (figure 9.1).

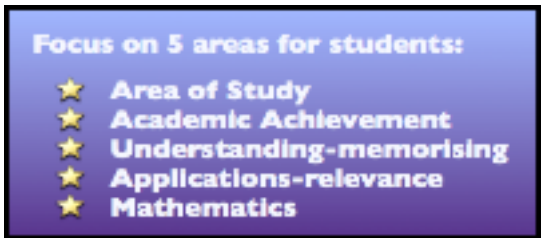

Figure 9.1 Focus on Five Areas for Students

This not only provided an opportunity to check the validity of the surveys but also to gain a richer picture of some areas of interest. The interviews followed the following sequence of ideas. Although specific questions are listed, there was freedom to expand as was appropriate in the light of the how the student responded. The planned interview structure is now shown but students were encouraged to expand as they wished.

(1) There was an open general fairly unstructured discussion to set the students at ease. The aim was to allow the students to relax and talk, to get used to the interviewer and know he is here not in any authority position. The following areas were raised:

- (a) Tell me about yourself: brothers, sisters, hobbies, interests.
- (b) What do you like least?
- (c) Is the syllabus you have as good as it might be ? Why ?
- (d) Have you ideas about what you want to do when you leave school?

(2) Areas of Study

- (a) Science, arts, technology - which are you following>
- (b) Why did you make that choice ?
- (c) Are you enjoying it ?

(3) Academic Achievement

- (a) How have got on in the past?
- (b) Which subjects are most difficult for you?

(4) Understanding-memorising

- (a) What is the best way to pass exams ?
- (b) Do you like learning things off by heart ?
- (c) Which is the most difficult subject to understand ?
- (d) How do try to understand ?

(5) Applications-relevance

(a) Do you sometimes think all of this learning is a waste of time ?
(b) What makes a subject meaningful for you ?
(c) If you were to plan what was to be taught, how would you change things ?
(d) What should be taught at school which you never seem to get ?

(6) Mathematics

(a) Do you like mathematics?
(b) Why do you like/dislike mathematics ?
(c) What is best/worst about mathematics ?
(d) Why is mathematics important ?
(e) Why is mathematics relevant/irrelevant

Each of these six areas is now discussed in turn, offering an outline of the key findings from the interviews. Notes from a sample interview are shown in full in the appendix to show the approach adopted. The aim was not to record and make transcripts but, using interviewer notes, to pick out key findings which seemed to be common among the students. This has to be seen in the context of the purpose of the interviews. They were designed to offer some evidence of the validity of the questionnaires as well as offering richer insights. The key aim was, therefore, corroboration. The interviewer was, therefore, seeking to see how the questionnaire findings were being reflected in the responses and the discussion rather than looking for much detail.

The opening question was simply designed to establish a relaxed interview setting and the findings were not regarded as important. Students started to talk freely. However, it was observed that most of them wanted to go on to complete their study at university or some kind of vocational college with high status.

Question 2 discussed their chosen areas of study. It has to remembered that students choose their subject direction at age 16 and then have to go to a specialist school. They are, therefore, committed into that area. Their reasons for making their choices were quite varied: examination results, future career intentions, their teachers and whether they found specific subjects interesting. Parents and friends also played their part but the location of the specialist school was also an important factor: travelling was an issue.

When considering their enjoyment, the issue of the power of the examination system stood out. Those who were doing well seemed to enjoy what they were doing but, at times, the lack of good results was seen as hindering them choosing what they really wanted to do. This illustrates the power of assessment systems to influence learners. Oraif (2007) found that confidence in relation to learning was almost entirely influenced by performance results. She noted the very real danger that, as some would fail examinations, their confidence might be severely damaged. Perhaps, course enjoyment and

a sense of fulfilment follow the same pattern. This raises a very real issue in relation to assessment. By its very nature, there will frequently be those who see themselves as 'failures'. The potential damage to future study can be immense. Yet, it may be impossible to have everyone 'passing'!

In looking at subject difficulty (question 3), mathematics again emerged although English, biology and geography were also identified. However, as the number of students interviewed was low, not too much can be made of this pattern.

The memorisation-recall issue was explored in question 4. In seeking to pass examinations, the students were experienced enough to appreciate that steady work at school and home throughout the year was important. Some students wanted to stay with memorisation and recall while others were less sure. The security of knowing what to learn and then simply committing it to memory, knowing that the rewards come from recalling the 'right' answers or procedures, was clearly a powerful influence.

In looking at understanding, the following order of subjects was apparent, with the most difficult first: mathematics, statistics, Arabic, physics, English, geography, history. Clearly, mathematics posed the greatest problems in relation to understanding and this may be the key to why the views about mathematics are so polarised. If the whole education system is designed to reward recall, then mathematics does pose the greatest difficulties in that it is very much a subject where understanding and applying procedures is one key emphasis. However, with the small sample, the order of difficulty must be treated with caution. It is interesting to see statistics come so high and this is very consistent with the large study of Ghani (2004) in statistics education where he found understanding proved to be immensely difficult.

In seeking to explore what makes understanding easier, there were few useful insights, the students tending to rely on more reading, more studying and paying more attention to the teacher.

Question 5 explored the relevance-applications issue. None of the students thought that studying was a waste of time, but saw the value mainly in terms of jobs and the future. There was clearly a utilitarian edge to their responses. Students had almost no ideas about what they would like to change and the only issue which was raised was the wish for more 'practical work'. However, their views of this were largely coloured by their limited experience of what this meant and they seemed to relate this to practical activities rather than to applying ideas and knowledge.

In looking at mathematics (question 6), there was general agreement that mathematics was very important for their daily life, that it is relevant with other subjects and of great general importance. Many, however, said that it was not 'their' subject while others had stopped studying mathematics altogether. Some felt that it was 'their' subject and it was important for their future life and study.

9.4 Teachers Interviews

As with the students, the aim in interviewing the teacher was to see whether the findings from the students were reflected in the views of the teachers. There were no teacher questionnaires. Therefore, the outcomes from these interviews were not really designed to check the validity of the questionnaire findings but more to see how the teachers saw things in the education system in their own country. Six teachers and one school inspector were involved representing a cross section of disciplines and educational experiences.

As with the students, the interviews with the teachers (and one school inspector) were semi-structured. The interviewer had a list of questions which were designed to start the discussion. In the light of the responses of the teachers, these areas were explored further. Four areas defined the agenda for the teacher interviews (figure 9.1).

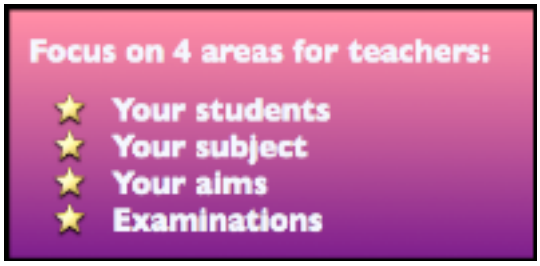

Figure 9.2 Focus on Four Areas for Teachers

The interviews followed the following sequence of ideas. Although specific questions are listed, there was freedom to expand as was appropriate in the light of the how the teacher responded. The following structure used was as follows:

(1) Open general discussion to set the teachers at ease. The following questions were posed:

- (a) What subject do you teach ?
- (b) Do you like teaching ?
- (c) What is most satisfying about teaching today ?

(2) Your Pupils

- (a) What are the most demanding problems with your pupils today ?
- (b) What would you like most of all to achieve for your pupils ?

(3) Your subject

(a) Why you like your subject ?
(b) Why is it important for your pupils ?
(c) Is the syllabus you have as good as it might be ? Why ?
(b) How would you like to change things in your subject ?

(4) Aims

(a) Which is more important ? Understanding or recall ?
(b) Which should be more important ? Understanding or recall ?
(c) How do you see the relevance to pupils of what you are asked to teach ?
(d) In what way(s) could it be made more real and relevant to them ?

(5) Examinations

(a) To what extent do the needs of passing exams affect your teaching ?
(b) Should exams be so important ?
(c) What should exams test
(b) Can you see better ways to assess students ?

The outcomes from these questions were not thought to be important for this project but it was interesting to note that the teachers represented seven different subject areas [chemistry, biology, English, physics, Islamic studies, mathematics and Arabic (the inspector)] in the curriculum. In discussing the first (satisfying aspects about teaching today), it was clear that passing on knowledge to the next generation was seen as a major factor.

Teachers saw many demanding problems (question 2). They identified a weak foundation of knowledge and lack of sequencing of ideas in syllabuses. They found it difficult to cope with the knowledge depth of the material they were required to teach as well as the current student levels of knowledge. Although they saw their students passing with reasonable results, they regretted the lack of home revision by their students and the students lacked the key skills for learning and finding things out. Their aims for their students tended to be subject based but, more generally, they emphasised the need for subjects to prepare for future careers. This was consistent with student perceptions. They did stress the desire to encourage the students to be open minded and be prepared for all aspects of life beyond school. Some identified problems in mathematics and considered that this started in grades 4 and 5 (ages about 10-12). This does not match the observations in the questionnaires for students where the students aged 12 hold the *best* views about most aspects of learning in mathematics.

Question 3 focussed on their own subject specialisms. As might be expected, they were committed to these and felt their own subject was interesting. They had great difficulty in justifying why it was important for the students, tending to fall back on 'syllabus requirements'. If this reflects the wider profession, this shows a very inadequate grasp of

the nature and place of education through their own subject specialisms. Again, in looking at their own specialisms, they lacked a clear perspective on what could be developed and why. The internet was suggested but how to use it was not addressed. The need for 'modern language' in the sciences was also mentioned.

However, they tended to be vague, referring to the university requirements as determining what should be taught and they used phrases like 'subject in depth', 'upgrade the available subject' with little clear conception of what these might mean. The interviewer gained the strong impression of teachers who saw themselves simply as the suppliers of information, determined by others, for purposes which were ill defined and it was not their business to question any of this. Indeed, the lack of critical thought and awareness of the wider need of the curriculum was a matter of some concern if this reflects the teaching force at large.

The weakness of the argument of using university requirements is determining school curricula has been addressed critically by Reid (1999) who showed that such an approach meant that, at every stage, the curriculum to be taught was decided by the need of the *minority*. The key thing the teachers wanted to change was the amount of content, the present system being so overloaded that it was almost impossible to cover everything in the time allocated. The basis of such curriculum reduction was not raised by any of them.

Question 4 tried to explore the issue of memorisation and recall. They demonstrated considerable confusion here seeing understanding as the way recall could be made better and using aims like, 'understanding and focus on the recall'. Indeed, they seem to be completely confused between what was meant by understanding when separated from recall, often seeing them as 'related to each other'. It has to be recognised that the teachers had come through a system where recall was rewarded and where, as a result, they were successful at recall. They seemed to see recall as the key and assumed that understanding was needed for recall. They did not appear to see understanding as more important than recall.

The idea that their students could simply pass examinations by recall without little understanding seemed foreign while the view expressed by some students in the questionnaire that they wanted more opportunity to think, to understand and to apply was not echoed in any way in the teachers expressed views.

In seeing better ways to make things more real and relevant, they mentioned the use of visual material but tended to be very vague using statements like, 'use educational methods in teaching' and 'use flexible and non flexible teaching methods'. However, they did argue for involving students in discussions although it was likely that they saw themselves as the focus of a class discussion rather than genuine group work. They did

want to make their subjects relate to normal life. However, the interviewer was left with the impression that they felt their own subjects were intrinsically interesting and relevant, this being based on the individual teacher's commitment to that discipline.

The final question focussed on examinations. They did seem to have the idea that the examination system could offer a control over what the curriculum should emphasise. They held the somewhat cynical view that the examinations were essential because 'it is the only time when students study'.

They recognised that there are major problems of cheating. They wanted less emphasis on end of year assessment and they want assessment to 'help students not destroy them!' Teachers clearly felt they are under pressure from parents who simply want examination passes and nothing else matters. The parents see the examinations defining success, with total neglect of other skills and attitudes. They argued that, to sort out all the problems about the examination system, there was a need to create strictly conducted, regular diets of examinations which allowed the students to gain success not simply on the basis of recalled information. In looking at new ways for assessment, there was some reluctance to move beyond the formal written examination papers. They did mention open discussion but did not work out what this meant. Perhaps, they were edging towards the idea of oral examinations in that they were aware of the presence of considerable cheating.

9.5 Conclusions

The interviews with the students were designed to confirm the findings from the questionnaires as well as to explore one or two topics in greater depth. In general , many of the findings from the questionnaires were confirmed. Thus, the factors which influenced the students in their choice of subject direction: examination results, future career intentions, their teachers and whether they found specific subjects interesting were broadly consistent. Parents and friends also played their part but the location of the specialist school was also an important factor: travelling was an issue. The students tended to see the value of studying mainly in terms of jobs and the future

The issue of the power of the examination system stood out very strongly. Some students wanted to stay with memorisation and recall while others were less sure. The security of knowing what to learn and then simply committing it to memory, knowing that the rewards come from recalling the 'right' answers or procedures, was clearly a powerful influence.

Mathematics again emerged as a difficult subject. Clearly, mathematics posed the greatest problems in relation to understanding and this may be the key to why the views about mathematics are so polarised. While there was general agreement that mathematics was

very important for their daily lives and of great general importance, many said that it was not 'their' subject while others had stopped studying mathematics altogether.

The interviews with teachers were planned to offer some new insights on the educational system from a different perspective. In many areas, there was some consistency with the student perceptions but, in other areas, new issues were identified.

Teachers identified weaknesses in the curriculum they were asked to teach: lack of sequencing of ideas, the knowledge depth of the material related to current student levels of knowledge. They tended to see their work in terms of students passing examinations and their future careers, consistent with student perceptions. They did stress the desire to encourage the students to be open minded and be prepared for all aspects of life beyond school but this was confused as they did not seem to see rote recall and understanding clearly. Of course, the teachers were, by their own education, good at recall and seemed to assume that understanding was needed for recall. In this, they seemed less aware than their students and there was little evidence that they shared the views of students when they wanted more opportunity to think, to understand and to apply. There was little conception of making things real or relevant: they did seem to want to make their subjects relate to normal life. They seemed to feel that their own subjects were intrinsically interesting and relevant.

Some identified problems in mathematics and considered that this started about ages 10-12, in contradiction to the students: those aged 12 held the *best* views about most aspects of learning in mathematics.

They had great difficulty in justifying why their subject was important for the students, tending to fall back of 'syllabus requirements'. Again, in looking at their own specialisms, they lacked a clear perspective on what could be developed and why. This presents a picture where the teachers are lacking professional skills seeing themselves simply as the suppliers of information, determined by others, for purposes which were ill defined. It was not their business to question any of this. All this may reflect the pressures on teachers with a system expanding too fast. However, the key thing the teachers wanted to change was a reduction in subject content.

They seemed to appreciate that the examination system could offer a control over what the curriculum should emphasise but saw them largely as ways to make students work. Cheating was recognised as a major problem and, encouragingly, they want assessment to 'help students not destroy them. Societal pressures were recognised. They argued that there was a need to create strictly conducted, regular diets of examinations which allowed

the students to gain success not simply on the basis of recalled information. Many of their views on examinations seemed to suggest some consistency with student perspectives.

In addition, the responses to the many questions give an overall picture where the students are fairly positive abut their school experiences and the learning approaches which are used. However, in a number of questions, there seems to be an expressed wish for freedom: freedom to question, freedom to express themselves, freedom to be relieved from the dominance of memorisation and recall. Despite this, they still rely on the security of the factual knowledge as the sources which is regarded in the black and white terms. Teachers are seen as the power. All of this reflects a system where the teacher is an authority figure, often see as beyond question, and the curriculum is based tightly on prescribed textbooks and the early question indicate a quite dramatic change in social structures relating to educational opportunities.

In general, the findings derived from the student interviews in this survey reinforce the views of students as expressed in the surveys.

Chapter Ten

Summary and Conclusions

10.1 Introduction

While there is a very large literature on attitudes, their development and measurement, there is a lack of detailed attitude measurement with school students, looking at the way they see their educational experience. What exists tends to reduce complex attitudes and beliefs to a single score, thus losing all the interesting detai.l. This study seeks to offer a series of pictures which illustrate the way typical Libyan students see their educational experiences in terms of their attitudes and perceptions.

Too often, educational planning is driven by politicians and educational managers in a country, and there are few attempts to consider how the school students react to their experiences. Very often teachers are left implementing policies and programmes over which they have little influence and they seek to make these as effective as possible with their students. This study seeks to fill this kind of gap by exploring the attitudes of Libyan students from age 12-20 on aspects of their educational journey, especially in relation to the curriculum.

This chapter seeks to bring together the findings from this study, to draw general conclusions and to make recommendations. Finally, the whole study is reviewed to pinpoint its strengths and weaknesses and to suggest further work which might arise from it as well as recommendations for Libya.

Definitions and descriptions of attitudes are reviewed and a broad definition of 'attitude' is proposed while various types of attitude are discussed. It is also recognised that not only is knowledge important, but also that the understanding, application, appreciation and use of that knowledge is a key part in education. Students need to develop their own attitudes and to be able to see the implications from what they are learning. Some of the research which has explored the way attitudes grow and develop has, therefore, been an important part of this study in that this offers insights into the kinds of curriculum experiences where attitude development is likely to take place.

The aim of this study has been to offer insights into the perception, beliefs and attitudes of students in Libya in an educational system where growth has been phenomenal over the past five decades or so. Change at that pace is difficult for any society and Libya has more or less developed an educational system from almost nothing in little more than fifty years. The educational experience of teenagers today is, therefore, likely to be quite

different from that experienced by their parents and completely new to their grandparents. This study seeks to see how they are reacting to this.

10.2 The Problems in Libya: Rapid Growth

In any country, the education of the next generation is of huge importance. For Libya, which has developed very rapidly, the education of young people will be vital for the future of the country. Previous work has noted some of the areas where there are problems as well as other areas of great success.

The main problem at present of education in Libya is the quality of education The need to build so much in order to educate so many in a short time creates the classical dilemma of quality of education versus quantity of education. This has led to a shortage of Libyan school teachers at secondary school level (especially High schools) especially those qualified in science subjects. There is frequently not enough equipment and facilities at some schools with classes often being too large with the lack of teachers. Finally, the curriculum tends to be relatively unrelated to life, and the examination system emphasises the rote recall of information and holds great power over the learners at key times of the year. Against this background, students are often not very satisfied or fulfilled in their studies and often show this by leaving school or simply failing to attend.

10.3 The Literature Background

It has been shown that aspects of the fundamental principles of learning will therefore apply to attitude development. However, the mechanisms for attitude development depend very heavily on dissonance type experiences and these will only occur in certain types of classroom activity. Lecture type instruction, with examinations focussed heavily on recall of information, will allow few opportunities for attitude development in any kind of systematic way. Thus, students in Libya are likely to develop their attitudes in their own ways, largely unstructured, and sometimes on an inadequate cognitive base.

The literature stresses that the development of attitudes has to serve a function within the individual. Overall, they allow the individual to make sense of the world: sense of the world around, sense of themselves, sense of relationships. Attitudes are directed towards an object and, in education, it is important to consider attitudes towards subjects studied, study itself and towards topics and themes being studied.

The importance of attitude perhaps lies in the way attitudes influence behaviour. Thus, negative attitudes may well hinder further study while these negative attitudes may linger

with the student throughout life, influencing future views, decisions and activities. The Theory Planned Behaviour has offered evidence about the way attitudes can influence behaviour when such behaviour is volitional.

In the context of science, Ramsay and Howe (1969) stated that "*A student's attitude towards science may well be more important than understanding of science, since his attitude will determine how he will use his knowledge".* The statement might well be modified: *A student's attitude towards subjects studied and the topics covered as well as study itself may well be more important than what is memorised and understood since attitudes will determine how knowledge and understanding will be used throughout life.*

With that in mind, the experimental outcomes are now summarised.

10.4 Review of the Experiments

The whole study involved very large numbers of students from age 12 to 20 in middle and high school in Libya. Table 10.1 summarises the samples used, these being selected to reflect the Libyan student population as closely as possible although, with separate schools, gender balance was not easy to achieve.

Surveys	First Survey	Second Survey	Third Survey	Fourth Survey	Total
Schools (32)	Middle + High	High	High	High	
Academic year	2003-2004	2004-2005	2005-2006	2006-2007	
Age	12-20	18-20	15-16	17-19	
Numbers	**859**	**343**	**737**	**13 + 7 teachers**	**1952 + 7 teachers**

Table 10.1 Samples involved Students Classification

10.5 Summary of Main Findings from Questionnaires

The aim in the first study was to gain a quick overview of the issues so that further study could be directed appropriately. Education holds a high status in much of Libyan society simply because it is seen as opening doors for jobs and life opportunities. Thus, with very strong social cohesion, the school students will tend to look upon their educational journey with a positive view. The pattern of responses here seems consistent with this picture.

With a great emphasis on memorisation and examinations which largely test recall, the passing of examinations controls entry to the next year of education and, thus, examinations are a very powerful influence on learning. Generally, the students recognised and accepted this (they know no other way).

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Teachers are seen as the sources of such knowledge and, even in their science subjects, memorisation still holds power. The system sees teachers as authority figures, often see as beyond question, and the curriculum is based tightly on prescribed textbooks and lecture type presentations.

Of the three major curriculum areas considered (Arabic, sciences, mathematics), Arabic is regarded best while mathematics shows major problems, with a very high degree of polarisation of views. While it is attractive to many, it is a source of problems for a large number.

There are clearly quite dramatic changes in social structures relating to educational opportunities with the opportunities for girls having grown enormously in very short space of time. Family sizes are dropping rapidly but resource levels in schools have not matched the pace of growth in education.

Against the background of these findings, the second survey looked at the final years of High school, with opportunities for the students to look backwards over their educational experiences.

Views of studies in Arabic tend to be positive but there is too much study of literature. Students see English as a key to other areas of study, especially in relation to the sciences. The sciences are seen in terms of career potential and the dominance of memory is a matter of concern. While they tend to see mathematics as rather difficult, they do not see it as overly abstract. Some find it more interesting than other subjects, others hold the reverse views. Nonetheless, mathematics does appear to be a major problem area in the curriculum.

They argue for a very much earlier start to studies in English. English is now vitally important for progress in many areas of study and many textbooks and resources are often only available in the English language, especially in the sciences. The internet illustrates how English dominates in many areas of study and many textbooks and resources are only available in the English language, especially in the sciences.

In examinations, they consider that there is too much memory dependence, with a fear of failure closing opportunities for the future. However, overall, it does seem that the students wish to see what they are doing being more related to the wider world around or even the nature and purposes of their school courses.

The lack of resources seen in the previous survey is also identified, in terms of teacher supply, teachers being asked to teach outside their specialisms as well as physical resources in terms of class sizes and equipment levels. Perhaps teacher status needs enhanced, the profession thus attracting more highly qualified entrants. Overall, there is a need for the education system to put in place some kind of pastoral support structure. The students seem to see the need for what might be called study skills and time organisation while a major influence in encouraging hard work is clearly seeing where it all leads.

Around age 15-16, students have to choose their subject specialism (typically, arts, sciences or technologies) and these are taught in separate, gender separated schools. This makes for considerable inefficiency, with students sometimes having to travel great distances to gain access to the specialism of their choice. Sometimes they do not opt for their favoured specialism in order to avoid such travel. This survey aimed to explore the influences on choices and attitudes towards subject areas.

In many areas any differences are much as might be expected. For example, girls around age 16 are much more mature than boys at the same age. They tend to be more conscientious and hardworking while boys tend to see things in more 'black and white' terms, enjoying practical aspects more and feeling more confident (perhaps overconfident?) in examinations.

Boys are more orientated towards careers seeing these as a more powerful influence over subject choices. For girls, interest holds a more powerful influence on subject choice while, for boys, career possibilities are more dominant. In thinking of subject popularity and subject choices, the marginal relevance of influences outside the school is very marked, consistent with previous studies. However, parents do have some influence on subject choices. Languages, biology and chemistry as well as mathematics and Islamic studies are

all attractive. However, physics faces problems, with its abstract and demanding courses. In addition, for a sizeable number, mathematics is also highly unattractive.

A very marked feature is also their desire to understand rather than memorise. They want explanations. While learners are capable of very large amounts of memorisation, understanding seems to be favoured. Nonetheless, they recognise the use of effective memorisation in passing examinations.

The students want to think things through for themselves and, perhaps want less imposition of ideas and emphasis on the recall of rote learned information. They are conscious that they have abilities of their own, they can think for themselves and, perhaps, they want to 'play with ideas' and come to their own conclusions. While they seemed to have enjoyed middle school, it is seen as too easy. Thus, either the curriculum, or the way the curriculum is organised, needs to be re-thought. This is a common problem in many countries.

10.6 Interviews

The interviews with the students were designed to confirm the findings from the questionnaires as well as to explore one or two topics in greater depth. In general , many of the findings from the questionnaires were confirmed.

The students tended to see the value of studying mainly in terms of jobs and the future. The issue of the power of the examination system stood out very strongly. Some students wanted to stay with memorisation and recall while others were less sure. The security of knowing what to learn and then simply committing it to memory, knowing that the rewards come from recalling the 'right' answers or procedures, was clearly a powerful influence.

Mathematics again emerged as a difficult subject. Clearly, mathematics posed the greatest problems in relation to understanding and this may be the key to why the views about mathematics are so polarised. While there was general agreement that mathematics was very important for their daily life and of great general importance, many said that it was not 'their' subject while others had stopped studying mathematics altogether.

Teachers identified weaknesses in the curriculum they were asked to teach: lack of sequencing of ideas, the knowledge depth of the material related to current student levels of knowledge. They tended to see their work in terms of students passing examinations and their future careers, consistent with student perceptions. There was little conception

of making things real or relevant: they did seem to want to make their subjects relate to normal life. They seemed to feel that their own subjects were intrinsically interesting and relevant.

This presents a picture where the teachers are lacking professional skills seeing themselves simply as the suppliers of information, determined by others, for purposes which were ill defined. It was not their business to question any of this. All this may reflect the pressures on teachers with a system expanding too fast. However, the key thing the teachers wanted to change was a reduction in subject content.

They seemed to appreciate that the examination system could offer a control over what the curriculum should emphasise but saw them largely as ways to make students work. Cheating was recognised as a major problem and, encouragingly, they want assessment to 'help students not destroy them'. Societal pressures were recognised.

10.7 Bringing it all Together

Looking at the three surveys and the interviews, the following general conclusions can be drawn

(1) The education system has grown at great speed and it is remarkable that it has achieved so much so quickly, the general satisfaction of students to many areas bering apparent. Nonetheless, there are some resource shortages and teacher shortages.

(2) Teachers are undervalued and their role is largely that of transmitting information in an efficient and effective manner to their students. They have little insight in the role of their subjects in the development of young people. They are ruled by the demands of society, with its dependence on examination success for gaining access to the next stage of life. They find the curriculum overcrowded and want more time for students ot be able to think. However, they have little clear idea of the nature and role of understanding and the idea of seeing their subject in terms of wider life (outside entry to careers) is largely absent.

(3) Although in the first survey investigating changes with age, from 12-20, there were not too many clear trends. However, for both mathematics and the sciences, student attitudes become steadily less positive with age, and this is a matter of concern.

(4) Learning is based on the reception of information through lectures and books. Students want to move away from this memorisation-based system to one where there is opportunity to think, reflect, and question. They are very keen on seeing

their studies as related to their life style and addressing the issues of importance to them. However, there is a fear of examinations and a reluctance to part with the security of recall.

(5) The Middle School experience, while enjoyable, is not seen as adequately demanding or stimulating. It is possible that there is curriculum trivialisation.

(6) The examination system poses many problems. Some are organisational: timing, coverage of curricula, cheating. However, the system controls student learning and everything is dependent on the end of year examinations. The students want less reliance on recall, less reliance on end of year examinations and they feel that they are being undermined by the ease of cheating.

(7) Schools seem to revolve round the transmission of knowledge and its subsequent recall. Students are asking for a broader experience where their wider needs are met. They seek some kind of pastoral care and support for learning.

(8) In looking at specific subject areas, the sciences need some overhaul. The students see them largely as memory driven and this presents the sciences as bodies of knowledge rather than methods of enquiry or ways of interpreting and understanding the world around. They have a utilitarian view of language, wishing less literature in Arabic studies and wanting to start English at a very much earlier age so that it is available for the world of sciences and so on.

Mathematics is a major problem area, generating polarised views. It is possible that this is due to the nature of mathematics itself. To gain satisfaction, it needs to be understood. The emphasis is on recall and this will mean recall of procedures in order to gain 'right' answers. This fails to portray mathematics as related to life and able to offer insights on the world around while it will also fail to allow students to be able to apply ideas successfully.

The problem subjects, therefore, appear to be mathematics and physics (with its abstractness) and, perhaps, chemistry. This is a matter of concern given the high proportions which take these subjects for career reasons.

(9) The results overall present a picture of an education system which does not have an adequate grasp of the purpose of school education. Much is based on careers, examination passing and recall. Understanding, applying ideas, creativity, questioning are all devalued. The idea of school education as a way to unlock potential in teenage learners seems missing and the students appear to appreciate that.

10.8 Strengths and Weaknesses of the Study

As with all attitude surveys, there is a real problem with validity and being sure that the students are showing what they really think rather than what they would like things to be. In all attitude work, any kind of absolute measurement is difficult and the best way forward is to look for trends and patterns. However, the interviews did seem to offer pictures which were broadly similar to the findings from the questionnaires. In addition, the samples were very large and representative of the population, and this suggests that reliability will not be a problem and that the results can be generalised.

The questionnaires were used to look at key points in the educational journey of the students. Nonetheless, it was difficult to gain access to schools and the gender balance at times was not good. However, the responses of the boys and girls tended to be fairly similar in many areas and this is probably not too great a problem. The aim was to focus on the students. If time had permitted, more interviews would have been useful and more interviews with teachers might have offered further insights. Indeed, given more time, access to examination marks might have offered an opportunity to relate performance to various aspects of attitude measurement.

10.9 Recommendations for Libya

The Libyan government and people are to be congratulated on developing their education system in such a short time. There has been an enormous investment into teachers, resources and schools to achieve all this. Nonetheless, from the student perspective, there are number of areas which need to be addressed:

(a) The training (and inservice training) of teachers needs a major overhaul so that a profession can be developed which knows the purposes of teaching more clearly and adequately. This will be a very difficult task;

(b) The aims of education need to be re-thought so that the dominance of recall and examinations can be reduced significantly. They key must lie in re-thinking the way examinations are set;

(c) Examinations need to be more frequent, less end-of year, based tightly on the aims and content of courses, and with an absence of cheating. This is largely a matter of tight organisation;

(d) Teaching and learning needs to be enriched with the use of less lecturing, more group work, and the use of curriculum inserts which allow knowledge to be applied realistically;

(e) The Middle School curriculum and organisation of teaching needs to be rethought completely, with the aim of making this time more open, more demanding, and each course taught only by teachers who are qualified and competent in the specific discipline;

(f) A system of pastoral care needs to be developed for all schools - models from other countries need to be considered;

(h) In the curriculum, specific things could be carried through easily:

(i) Free the sciences from the almost total dependence on recall;
(ii) Re-structure mathematics so that it appeals to everyone (the Scottish model?);
(iii) Start English at nursery levels when language learning is much easier;
(iv) Re-design the syllabuses in chemistry and, especially, physics.

10.10 Suggestions for Future Study

As with all research studies, a number of issues have been raised by this study which would need further exploration. It has to be recognised that this is the first study of its kind in Libyan education. Much more work is needed.

One of the problems which emerged from the study was the way the teachers did not seem to see why they were doing what they were doing. They did not seem to appreciate the nature of learning, seeming to confuse the idea of memorisation with confuse with understanding. They clearly had no conception of curriculum development.

All this is inevitable in that these teachers were brought up in a memorisation-examination driven system and they were successful in it. They teach in ways which reflect their past experience. Major research is now needed to explore how teachers views can be developed. This must not be underestimated in that a complete paradigm shift is needed. The recent study by El-Sawaf (2007) with primary teachers shows how difficult this may be.

The recent monographs by Mbajiorgu and Reid (2006a, 2006b) summarised the research literature about curriculum construction relating to chemistry and physics. However, research is now needed to see how their conclusions can be translated into practice in such a way that it will be acceptable to teachers in Libya?

This seesms to be particularly important for physics and chemistry, which happen to be the subjects considered in the two monographs. Specifically, mathematics needs considerable discussion and research. In Scotland, mathematics is highly popular with

most students. How is this achieved and are there lessons which could usefully be applied in Libya? However, the culture of mathematics in Scotland cannot easily be transferred into another educational culture. What needs to be done is to find out what features underlie this culture to see to what extent they are applicable in Libya.

10.11 Final Thoughts

The education system in Libya has grown at remarkable rate and the study here shows that the students are quite positive about many aspects of their experiences. Of course, they know of no other educational system. The work here has identified a number of areas where improvements might be made. Most fundamental of all is the need to generate a new way of thinking: where the recall of information under an examination-driven system is changed to an educational experience where understanding, applying ideas, creativity and questioning hold a much higher status. This will need a major paradigm shift for teachers and the wider society in Libya and it is hoped that the outcomes of this study will be able to make a small contribution to this debate.

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Appendices

University of Glasgow, Scotland
Centre for Science Education

This questionnaire is designed to find out your views about your learning experiences.
Your answers will not affect your school marks.
Please express your honest feelings as this will help us understand your learning better.
Most questions can be answered by ticking a box.

(1) Are you ☐ boy ☐ girl Your age: ……..

(2) Which school do you attend? ……

(3) How do you travel to school? ……

(4) How many brothers and sisters do you have? brothers: …… sisters: ……

(5) How many of your brothers and sisters are ***older*** than you? ……

(6) How many pupils usually are in your class: ☐ Less than 20 ☐ 20-25 ☐ 25-30 ☐ 30-35 ☐ 35-40 ☐ More than 40

(7) What is your parents' level of education?

	compulsory	high	university
mother	….	….	….
father	….	….	….

(8) Directions of study you have already chosen or are considering: ☐ Arts ☐ Science ☐ Technological study

(9) Would you like to have good qualifications? ☐ yes ☐ no

(10) Where would you like to see yourself in the nearest future? (*Tick as many as you wish*)

☐ leaving school as soon as possible to take a job
☐ training to be a doctor, nurse, or health worker
☐ having a family
☐ going to university
☐ training to be a teacher
☐ working as an engineer
☐ being involved in sport
☐ working in art, music or drama
☐ travelling widely
☐ others, please state……

(11) What do you like to do in your free time? .....

(12) List your favourite ***three*** school subjects ***in order***: (1) ……..…… (2) …..……..….. (3) ……...…..

(13) What is *least* favourite school subject? ……..……

(14) How much do you agree?
Tick one box in each line to show how far you agree with each statement from strongly agree to strongly disagree.

I enjoy using new technology like computers in my learning	☐	☐	☐	☐	☐
I do *not* believe in just accepting what the teacher says without question. Success involves thinking for myself	☐	☐	☐	☐	☐
I like exams which give me an opportunity to show I have ideas of my own	☐	☐	☐	☐	☐
I prefer to learn the facts and then be tested on them in short questions	☐	☐	☐	☐	☐
My school is well equipped to help me learn well	☐	☐	☐	☐	☐
There are too many pupils in my class	☐	☐	☐	☐	☐
In order to pass my courses, I need to study just what the teacher tells me	☐	☐	☐	☐	☐
My school does *not* have enough computers	☐	☐	☐	☐	☐
We cannot call anything scientific knowledge if it is not absolutely true.	☐	☐	☐	☐	☐
I believe it is the job of the teacher to supply me with all the knowledge	☐	☐	☐	☐	☐
All one has to do in science is to memorise things	☐	☐	☐	☐	☐
My school is preparing me well for what I shall do later in life	☐	☐	☐	☐	☐
In exams, I like questions that give me the scope to go beyond what is taught and show my ability to think	☐	☐	☐	☐	☐

Please Turn Over

Here is a way to show what you think of a racing car

quick	☑ ☐ ☐ ☐ ☐ ☐	slow
important	☐ ☐ ☑ ☐ ☐ ☐	unimportant
safe	☐ ☐ ☐ ☐ ☑ ☐	dangerous

The positions of the ticks between the word pairs show that you consider it as very quick, slightly more important than unimportant and quite dangerous.

Use the same method of ticking to how your opinions in the following questions

(15) What are your opinions about your ***studies in science subjects***?
Tick ONE box on each line.

Not helpful	☐ ☐ ☐ ☐ ☐ ☐	Helpful
Easy to understand	☐ ☐ ☐ ☐ ☐ ☐	Not easy to understand
Boring	☐ ☐ ☐ ☐ ☐ ☐	Interesting
Well organised	☐ ☐ ☐ ☐ ☐ ☐	Not well organised
The best part of school	☐ ☐ ☐ ☐ ☐ ☐	The worst part of school
Not enjoyable	☐ ☐ ☐ ☐ ☐ ☐	Enjoyable

(16) What are your opinions about your ***studies in Arabic language***?
Tick ONE box on each line.

Not helpful	☐ ☐ ☐ ☐ ☐ ☐	Helpful
Easy to understand	☐ ☐ ☐ ☐ ☐ ☐	Not easy to understand
Boring	☐ ☐ ☐ ☐ ☐ ☐	Interesting
Well organised	☐ ☐ ☐ ☐ ☐ ☐	Not well organised
The best part of school	☐ ☐ ☐ ☐ ☐ ☐	The worst part of school
Not enjoyable	☐ ☐ ☐ ☐ ☐ ☐	Enjoyable

(17) What are your opinions about your ***studies in Mathematics***?
Tick ONE box on each line.

Not helpful	☐ ☐ ☐ ☐ ☐ ☐	Helpful
Easy to understand	☐ ☐ ☐ ☐ ☐ ☐	Not easy to understand
Boring	☐ ☐ ☐ ☐ ☐ ☐	Interesting
Well organised	☐ ☐ ☐ ☐ ☐ ☐	Not well organised
The best part of school	☐ ☐ ☐ ☐ ☐ ☐	The worst part of school
Not enjoyable	☐ ☐ ☐ ☐ ☐ ☐	Enjoyable

(18) What are your opinions about ***learning in school***?
Tick ONE box on each line.

I feel I am coping well	☐ ☐ ☐ ☐ ☐ ☐	I feel I am not coping well
I am not enjoying school	☐ ☐ ☐ ☐ ☐ ☐	I am enjoying school
I have found school work easy	☐ ☐ ☐ ☐ ☐ ☐	I found school work hard
My school results are getting worse	☐ ☐ ☐ ☐ ☐ ☐	My school results are getting better
School is benefitting me	☐ ☐ ☐ ☐ ☐ ☐	I am wasting my time at school
Work at school is relevant to my needs	☐ ☐ ☐ ☐ ☐ ☐	Work at school is irrelevant to my needs
My parents are interested in my education	☐ ☐ ☐ ☐ ☐ ☐	My parents are not interested in my education

(19) What are your opinions about ***learning approaches in school***?
Tick ONE box on each line.

I find my textbooks helpful	☐ ☐ ☐ ☐ ☐ ☐	I find my textbooks unhelpful
Examinations do not help me to learn	☐ ☐ ☐ ☐ ☐ ☐	Examinations help me to learn
I enjoy practical work at school	☐ ☐ ☐ ☐ ☐ ☐	I do not enjoy practical work at school
I like the way my school is run	☐ ☐ ☐ ☐ ☐ ☐	I do not like the way my school is run
School tells me what I have to memorise	☐ ☐ ☐ ☐ ☐ ☐	School encourages me to think for myself
Most subjects at school are useful	☐ ☐ ☐ ☐ ☐ ☐	Most subjects at school are not useful
I prefer working on my own	☐ ☐ ☐ ☐ ☐ ☐	I prefer working in a group

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Thank you for your help
All the best in Your Studies

How You See Your Studies

This questionnaire asks you to look back on your school experience
Your answers will not affect your marks in any way

(1) Think about your school studies in Arabic language

Tick one box on each line to indicate your view.

(a) It is essential to be able to write Arabic clearly and accurately ☐☐☐☐☐
(b) Too much emphasis was placed on Arabic literature in my studies ☐☐☐☐☐
(c) I find studying Arabic grammar difficult ☐☐☐☐☐
(d) My studies in Arabic did not help me to read more ☐☐☐☐☐
(e) The examinations system affects the development of my Arabic skill ☐☐☐☐☐
(f) My studies in Arabic prepare me well for further study ☐☐☐☐☐
(g) The time for each Arabic class is enough ☐☐☐☐☐

(2) Think about your school studies inEnglish language

Tick one box on each line to indicate your view.

(a) Learning English is essential in today's world ☐☐☐☐☐
(b) The most important skills is being able to speak English ☐☐☐☐☐
(c) Reading English is essential for those involved in science and tech'y ☐☐☐☐☐
(d) Learning English should be started at a very young age. ☐☐☐☐☐
(e) English is helpful in many activities when I leave school. ☐☐☐☐☐
(f) English textbooks are not helpful ☐☐☐☐☐
(g) English language will help me in my future career ☐☐☐☐☐
(h) My school has proper audiovisual aids for learning English ☐☐☐☐☐
(i) Most of the time we talk Arabic during the English lessons ☐☐☐☐☐

(3) Think about your school studies in science subjects (biology, chemistry and physics)

Tick one box on each line to indicate your view.

(a) Science is too dominated by Western thought ☐☐☐☐☐
(b) My studies have helped me to make sense of the world around ☐☐☐☐☐
(c) Learning science successfully depends .. having a good memory ☐☐☐☐☐
(d) My textbooks were not easy to understand ☐☐☐☐☐
(e) Science is often far too difficult ☐☐☐☐☐
(f) Much of my science was unrelated to life ☐☐☐☐☐
(g) The curriculum of science does not suit me ☐☐☐☐☐
(h) It would help me get a good job in the future ☐☐☐☐☐
(i) Studying science can make our live healthier ☐☐☐☐☐
(j) A good thing about learning science is the fact that evrything ☐☐☐☐☐
is so clear-cut: either right or wrong ☐☐☐☐☐

(4 Think about your school studies in mathematics

Tick one box on each line to indicate your view.

(a) I find mathematics to be very useful in daily life ☐☐☐☐☐
(b) Mathematics is only needed by those studying subjects like the sciences ☐☐☐☐☐
(c) Some pupils can 'do' mathematics, others cannot 'do' mathematics. ☐☐☐☐☐
(d) Mathematics tends to be too abstract ☐☐☐☐☐
(e) I find mathematics easy ☐☐☐☐☐
(f) Mathematics is definitely my subject ☐☐☐☐☐
(g) My mathematics class was more interesting than other subjects ☐☐☐☐☐
(h) Mathematics is not preparing me well for further study ☐☐☐☐☐

(5) Think about the way you were tested in school tests and examinations.

Tick one box on each line to indicate your view.

(a) There is too much emphasis on memory skills ☐ ☐ ☐ ☐ ☐
(b) Examination and test results made me feel a failure. ☐ ☐ ☐ ☐ ☐
(c) I like the way examinations were organised. ☐ ☐ ☐ ☐ ☐
(d) Test and examinations in Arabic seem unrelated tolanguage ☐ ☐ ☐ ☐ ☐
(e) Tests in the sciences involved little more than recalling facts ☐ ☐ ☐ ☐ ☐
(f) I think that the examinations system affects the development of my skills ☐ ☐ ☐ ☐ ☐
(g) The quality of the curriculum is vital to encourage students to stay at school ☐ ☐ ☐ ☐ ☐
(h) I liked mathematics tests and examinations because they gave me scope to show my understanding ☐ ☐ ☐ ☐ ☐

(6) Imagine you are the adviser to a government minister in charge of secondary school education. He asks you for the three best features of current Libyan education and the three worst features:
List these, using one sentence to describe each:

	Best Features	**Description of why the feature chosen is so good**
1		
2		
3		

	Worst Features	**Description of why the feature chosen is so good**
1		
2		
3		

(7) In three sentences, write down what you consider to be the most important reasons for pupils working hard until they complete their secondary education.

(8) Imagine you are living in the year 2020. In what ways will secondary education in Libya have to change to meet the needs of the future? Describe these in no more than three sentences.

Thank You

Centre for Science Education

Why are you Doing what You are Doing ?

This questionnaire explores the subjects you are studying and why you chose them.

Your answers will NOT affect your school marks in any way

Your Name: ..... Boy ☐ Girl ☐ Your School:.....

Course Chosen (*tick one box*): ☐ Arts-based ☐ Science-based ☐ Technology-based

Subjects being studied at the moment (*list all the subjects you are studying this year*):

....
....
....
....

---

(1) You will like some subjects better than others.

(a) What is your favorite subject: .....

(b) What is your second favorite subject: .....

(c) What subject do you like least ? .....

(d) Thinking of your favorite subject, explain why you like it best:

.....

.....

.....

(2) Thinking of the course you are now studying, here are some reasons for choosing that course.
Tick all the reasons that are true for you

☐ I do not like science subjects
☐ Mathematics is my best subject
☐ I like learning languages
☐ My teacher encouraged me
☐ I think my course will lead to good jobs
☐ These subjects are the ones where I gain the best marks
☐ I am doing what parents encouraged me to do
☐ I like doing practical things
☐ The subjects are impotant for study at university for my chosen career.
☐ I think my course will help me to understand the world.
☐ I find the sciences too difficult

(3) Think about the way you like to learn
(Tick one box on each line)

(a)	I prefer to learn by reading books.	☐	☐	☐	☐	☐
(b)	I have a good memory.	☐	☐	☐	☐	☐
(c)	I like to understand things rather than simply memorise them.	☐	☐	☐	☐	☐
(d)	I like subjects where things are clearly right or wrong.	☐	☐	☐	☐	☐
(e)	I find I rely heavily on clear explanations from the teacher.	☐	☐	☐	☐	☐

(f) I learn best when I do things for myself. ☐ ☐ ☐ ☐ ☐
(g) I like doing subjects which involve calculations. ☐ ☐ ☐ ☐ ☐
(h) I often see ideas in terms of mental pictures. ☐ ☐ ☐ ☐ ☐
(I) I am sure I shall pass my examinations. ☐ ☐ ☐ ☐ ☐

Please Turn Over

(4) Think of your middle school experience
(Tick one box on each line)

I enjoyed it	☐☐☐☐☐☐	I hated it
It was too easy	☐☐☐☐☐☐	It was too difficult
It helped me to think of possible careers	☐☐☐☐☐☐	I still do not have a clear career direction
There was not enough time in science	☐☐☐☐☐☐	There was too much time in science
I did well in my exams	☐☐☐☐☐☐	I did badly in my exams
My best marks came in arts subjects	☐☐☐☐☐☐	My worst marks came in arts subjects

(5) Think of your life as whole.
Tick the three which you think are most important for you.

☐ My abilities
☐ My academic achievement
☐ My popularity
☐ My expertise
☐ My attractiveness
☐ My sporting skill
☐ My willingnesss to take risks
☐ My sociability
☐ My creative ability
☐ My independent mind

(6) Imagine your are faced with a new and demanding type of problem in your studies.
What is your likely reaction?
Tick as many as you wish

☐ Worry about passing the examinations
☐ See it as a challenge
☐ Start to panic
☐ Seek help from my teacher
☐ I have manged in the past- I'll managed now
☐ Think of changing my course
☐ Enjoy it because it is new
☐ Seek help from others

(7) What made you choose ?

You have now chosen your course (science, arts, or technology)
*In no more than three sentences, say **why** you made your choice.*

Thank you for your help

Centre for Science Education, University of Glasgow

Student Interviews

(maximum 20 minutes)

(1) Introduction

Get students to relax and talk

Take no notes

Make sure they know you are not in authority

(a) Tell me about yourself: brothers, sisters, hobbies, interests....

(b) What is your favourite subject?

(c) What do you like least?

(d) Have you ideas about what you want to do when you leave school?

(2) Area of Study

(a) Science, arts, technology ?

(b) Why choose ?

(c) Are you enjoying it ?

(3) Academic Achievement

(a) How have got on in the past?

(b) Which subjects are most difficult ?

(4) Understanding-memorising

(a) What is the best way to pass exams ?

(b) Do you like learning things off by heart ?

(c) Which is the most difficult subject to understand ?

(d) How do try to understand .... ?

(5) Applications- relevance

(a) Do you sometimes think all of this learning is a waste of time ?

(b) What makes a subject meaningful for you ?

(c) If you were to plan what was to be taught, how would you change things ?

(d) What should be taught at school which you never seem to get ?

(6) Mathematics

(a) Do you like mathematics?

(b) Why do you like/dislike mathematics ?

(c) What is best/worst about mathematics ?

(d) Why is mathematics important ?

(e) Why is mathematics relevant/irrelevant ?

Teacher Interviews

(maximum 30 minutes)

(1) Introduction

Get teachers to relax and talk

Take no notes

Make sure they know you are not in authority

(a) What subject do you teach ?

(b) Do you like teaching ?

(c) What is most satisfying about teaching today ?

(2) Your Pupils

(a) What are the most demanding problems with your pupils today ?

(b) What would you like most of all to achieve for your pupils ?

(3) Your subject

(a) Why you like your subject ?

(b) Why is it important for your pupils ?

(c) Is the syllabus you have as good as it might be ? Why ?

(d) How would you like to change things in your subject ?

(4) Aims

(a) Which is more important ? Understanding or recall ?

(b) Which should be more important ? Understanding or recall ?

(c) How do you see the relevance to pupils of what you are asked to teach ?

(d) In what way(s) could it be made more real and relevant to them ?

(5) Examinations

(a) To what extent do the needs of passing exams affect your teaching ?

(b) Should exams be so important ?

(c) What should exams test ?

(d) Can you see better ways to assess students ?

Sample Interview Notes

This shows the notes taken during two interviews, illustrating the approach taken.

Student interview: student (A) End year of Economics high school level, Age ??

(1) ***General***

(a) Tell me about yourself: brothers -5, sisters - 1, hobbies - sports, interests - general culture

(b) What do you like least? Statistical and insurance companies

(c) Is the syllabus you have as good as it might be ? yes. Why ? it is interesting and my favourite subject

(d) Have you ideas about what you want to do when you leave school? go to university to complete my degree.

Comment: General view of education as utilitarian, moving to next stage.

(2) ***Area of Study***

(a) Science, arts, technology ? science

(b) Why choose ? appetite and enjoyment

(c) Are you enjoying it ? yes

(3) ***Academic Achievement***

(a) How have got on in the past? at first year I found it so difficult

(b) Which subjects are most difficult ? English language

(4) ***Understanding-memorising***

(a) What is the best way to pass exams ? Understanding firstly and memorising.

(b) Do you like learning things off by heart ? no, try to understand first

(c) Which is the most difficult subject to understand ? English language

(d) How do try to understand ? to focus on studying at school and at home all of the year school, and to focus on the class what teacher tell us.

Comment: Reveals utter confusion about nature of understanding:

(5) ***Applications- relevance***

(a) Do you sometimes think all of this learning is a waste of time ? no

(b) What makes a subject meaningful for you ? for the future, to have good job, daily life.

(c) If you were to plan what was to be taught, how would you change things ? to give more opportunity for the practical work at school and the areas which related to my study.

(d) What should be taught at school which you never seem to get ? practical work at school for my careers to have good job, daily life

Comment: It seemed that the interviewee saw practical' as a way to describe the way knowledge was applied in life in practical circumstances, rather than any traditional concept of practical activities, reflecting utilitarian view.

(6) ***Mathematics***

(a) Do you like mathematics? yes

(b) Why do you like/dislike mathematics ? I like it because it is very quite related with my subject (Economics)

(c) What is best/worst about mathematics ? the best about mathematics: its dependence on memorisation and related with our life and to help people to sort out most of thing

(d) Why is mathematics important ? related with our life. and to used in huge areas, and is relevant with other subjects

(e) Why is mathematics relevant/irrelevant, for relevant: to help people to sort out most of thing in their life or irrelevant, have no idea.

Comment: Total vagueness, mathematics is seen as good because it is useful in a utilitarian sense with the key area of study.

Teacher Interview Teaching Chemistry School: Medicine Science High school

(1) ***General***

(a) What subject do you teach ? Chemistry.

(b) Do you like teaching ? Yes

(c) What is most satisfying about teaching today ? it is impacting knowledge to humanity

(2) ***Your Students***

(a) What are the most demanding problems with your pupils today ?
weak foundation on the compulsory education, no sequences in syllabus, lack of home revision

(b) Students they must to understand the subject very good pass their exams with reasonable results.

Comment: Typical of blaming others for problems !

(3) ***Your subject***

(a) Why you like your subject ? interesting subject, many specialisation and interesting.

(b) Why is it important for your pupils ? syllabus requirements, related to other subject and modern science language, also syllabus requirement

(c) Is the syllabus you have as good as it might be ? Why ? it is dependence on the kind of subject at the level of class, some subjects with no prerequisite

(d) How would you like to change things in your subject ? level of subjects should be taught at university level, subject are in depth needed to be divided through years, upgrade the available subject

Comment: Very limited view: subject is interesting because it is interesting to teacher, no idea of how it fits and why it is important.

(4) ***Aims***

(a) Which should be more important ? Understanding or recall ? understanding in first degree and then recall, where it is the way to understand, important for persuasion (individual and information)

(b) How do you see the relevance to pupils of what you are asked to teach ? Understanding is a prior stage of recalling

(c) In what way(s) could it be made more real and relevant to them ? understanding and focus on the recall

(d) both related to each other and important for persuasion (individual and information), both ways are good to encourage processing information without understanding memorising does exist and without memorising, recalling does not exist.

Comment: Shows a complete confusion - the teacher does not seem to understand what 'understanding' actually means. Almost seems to see under standing in terms of memorising at times

(5) ***Examinations***

(a) To what extent do the needs of passing exams affect your teaching ? use educational methods in teaching and involve students in discussions and complement the theory subjects.

(b) Should exams be so important ? In the recent time exams is so important, because there is no other way to assess students and to measure their ability and the level of their understanding the concept of the context of the curricula.

(c) What should exams test ? exams should care about the different level of students, exams should be including which students study, some other ways such as open discussion

(d) Can you see better ways to assess students ? use different systems in exam to assessment exam result help students in understanding the subject from different teacher, have oral exam to minimise the cheating problem, exam question should avoid specific style to know how much students know in depth.

Comment: Reveals a complete lack of understanding of the whole area of assessment, covered by much which is completely vague,; however, cheating is a problem.